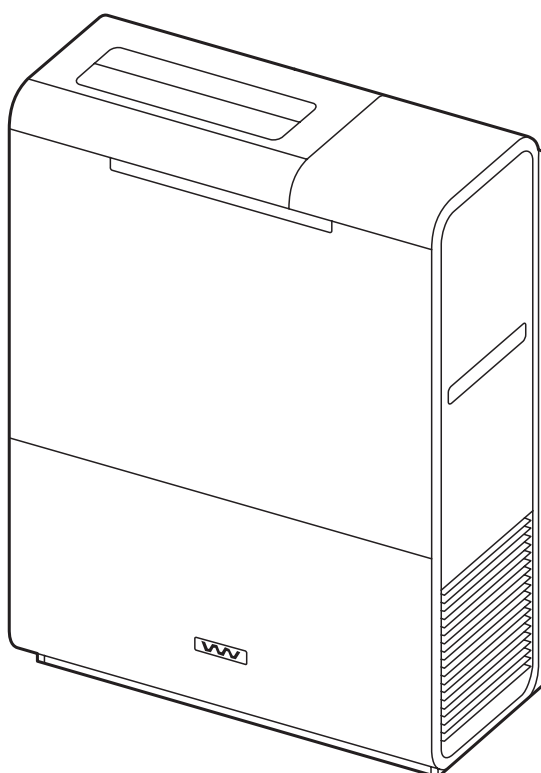


# TECHNICAL DATA & SERVICE MANUAL

## With Virus Washer Function

## Space Cleaning System

### ■ Floor-mounted model VW-VF10BG



#### ! **RoHS**

- This product does not contain any hazardous substances prohibited by the **RoHS** Directive.

#### ! **WARNING**










- You are requested to use **RoHS** compliant parts for maintenance or repair.
- You are requested to use lead-free solder.









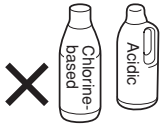




# IMPORTANT


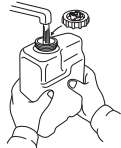
## Safety Information
















Be sure to read the following important safety information for safe and correct use of the product.


The items listed here represent important information related to safety. The indicators and their meanings are as shown below.

 <b>WARNING</b>	Incorrect handling or use may result in death or serious injury to the user.		
 <b>CAUTION</b>	Incorrect handling or use may result in injury to the user, or in property damage.		
 "Prohibited": Indicates a prohibited action.	 "Required": Indicates a required action.	 "Do not disassemble": Indicates that disassembly is prohibited.	 "Do not touch": Indicates that contact is prohibited.
 "Unplug": Indicates that the power cord must be unplugged.	 "Electric Shock Danger" (Located on main unit): Indicates that there is the danger of electric shock.	 "Do not wet": Indicates that contact with water is prohibited.	

 <b>WARNING</b>		
<b>Do not disassemble or modify.</b> Do not attempt to disassemble for repair or to modify this system. Doing so may result in fire, electric shock, or injury. For repairs, consult with the dealer where the product was purchased.  Do not disassemble	<b>Do not apply water.</b> Do not immerse this unit in water or apply water to it. Doing so may result in a short circuit and electric shock.  Do not wet	<b>Do not insert foreign objects.</b> Do not insert metal objects such as pins or needles, or other foreign objects, into the intake, outlet, or water tank installation port. Doing so may result in injury due to electric shock, or in abnormal operation of the system.  Prohibited
<b>Unplug the power cord before cleaning or servicing the system.</b> When cleaning or servicing the system, be sure to first unplug the power cord. Failure to do so may result in electric shock or injury.  Unplug	<b>Do not damage the power cord.</b> Do not scratch, cut, modify, bend excessively, pull on, twist, or otherwise damage the power cord. Damage to the power cord may result in fire or electric shock.  Prohibited	<b>Do not plug or unplug the power cord with wet hands.</b> Doing so may result in electric shock.  Prohibited
<b>Do not use with any power other than 220 – 240 V AC power. Do not plug multiple cords into the same outlet.</b> Doing so may result in fire, electric shock, or damage to the system.  Prohibited	<b>Do not use chlorine-based or acidic detergents when cleaning the water tank, unit, or filters.</b> These detergents may result in deformation and discoloration.  Prohibited	<b>Insert the power plug securely, all the way to the base.</b> Do not use a plug that cannot be fully inserted or that is damaged. Do not use a loose power outlet. Doing so may result in electric shock or in fire caused by over heating.  Required
<b>Remove dirt or dust from the power plug.</b> Regularly remove any dirt or dust from the power plug. If dirt or dust accumulates on the power plug, humidity or other factors may cause an insulation failure, resulting in fire.  Required	<b>A leakage breaker is required.</b> Use a power source that includes a leakage breaker. Failure to do so may result in electric shock or fire.  Required	<b>Do not use insecticides or aromatics.</b> Do not use insecticides, aromatics, or mosquito coils while the unit is operating. Doing so can cause system malfunction.  Prohibited

 <b>CAUTION</b>
<b>Fill the water tank with fresh water every day.</b> Rinse out the water tank every day and keep it clean. Then be sure to refill it with fresh tap water. If you continue to use the tank without cleaning it, sediment and water scale may decrease the performance of the unit, or may cause the growth of mold or bacteria, resulting in odor.  Required

 <b>CAUTION</b>		
<b>Do not place any containers that contain liquid on top of the system.</b> Doing so may result in system malfunction.  Prohibited	<b>Do not perform cleaning while the system is operating.</b> Doing so may result in electric shock or injury.  Prohibited	<b>Do not obstruct the outlet.</b> Do not obstruct the air outlet with a curtain, towel, or other item. Doing so may result in system malfunction.  Prohibited
<b>Be sure to securely reinstall all components after cleaning.</b> Using the unit without the water tank, filter, or other component securely installed may result in system malfunction.  Required	<b>Grasp the power plug when unplugging the power cord.</b> When unplugging the power cord, do not grasp the cord. Instead, be sure to grasp the power plug at the end of the cord and pull out the plug. Unplugging the cord incorrectly may result in electric shock, short circuit, or fire.  Required	<b>Do not place any items on the unit.</b> <b>Do not climb onto the unit.</b> Doing so may result in system malfunction, or in the unit tipping over.  Prohibited
<b>Install the system indoors, and use in an environment between 5°C and 35°C.</b> In a particularly cold environment, the freeze-prevention function may be activated, and the unit may not operate even when the power switch is turned ON.  Required	<b>Do not use the system with the filter removed.</b> Dust entering into the system may cause system malfunction.  Required	<b>Install in a location where there is little humidity, oil mist, or other airborne substance.</b> Select a location for use that is free of humidity, dust, oil smoke (oil particles generated from cooking), and salt. Failure to do so may result in odors or in system malfunction.  Required
<b>Do not install in a location exposed to dripping water.</b> Doing so may result in system malfunction.  Prohibited	<b>Avoid installation in high locations. Install in a flat and stable location.</b> Observe this precaution in order to ensure that the system functions correctly. Failure to do so may result in the unit tipping over due to earthquake or contact by persons.  Required	<b>Secure space of 10 cm or more at the left and right sides of the unit.</b> Also, allow servicing space of 100 cm or more above and to the front of the unit. Failure to do so may result in system malfunction.  Required
<b>When relocating or storing the product (if it will not be used for a long period of time), drain the electrolyzed water and dry the air purification element.</b>  Required	<b>This system is not able to break down or remove toxic gasses and substances.</b> <b>Be sure to open a window or otherwise ventilate the interior of the room if a release occurs.</b> If the system is used for a long period in a small room, open a window and ventilate the room as necessary.  Required	

 <b>IMPORTANT INFORMATION</b>		
<b>Be sure to use normal tap (drinking) water.</b> Never use water from a water purifier, water from a water heater, alkali ion water, mineral water, well water, seawater, or other types of water. These types of water cannot be electrolyzed and can cause the growth of mold or bacteria, resulting in odor.	<b>The electrolysis condition must be set correctly according to the water quality in the region where the product is used.</b> For details, refer to "Setting the electrolysis condition."	<b>Do not unplug the power cord, even if the unit will not be used for a while.</b> Even when the unit is stopped, cleaning inside the system is performed automatically. Check that there is water in the water tank, and do not unplug the power cord.
<b>Perform regular cleaning.</b> Follow the instructions under "Cleaning the System," in order to clean and maintain the unit. If the unit becomes especially dirty, mold may grow, resulting in odor.	<b>Do not direct the discharged air directly onto walls or furniture.</b> Do not allow the discharged air to directly contact walls or furniture. It may damage the walls or furniture, resulting in stains.	<b>Be careful of freezing.</b> Freezing may result in system malfunction and damage.

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# 1. System Features

## 1. Air cleaning using electrolyzed water

The combination of electrolyzed water with the Virus Washer element creates a “virus washer” function which is able to remove airborne viruses and bacteria from the air.

## 2. What is electrolyzed water?

When tap water is electrolyzed it becomes electrolyzed water that contains electrolyzed hypochlorous acid, a chemical that has a disinfecting effect. This effect is used to remove airborne viruses and bacteria from the air.



### CAUTION

This system includes a function for removing airborne viruses from the air, however it is not a means of preventing or treating viral infections.

The air passes through the Virus Washer element which is moistened with electrolyzed water.

Indoor air is taken in.

The purified air is discharged after it has been purified by the electrolyzed water.

Indoor air is taken in.

Indoor air is taken in.

# 2. Name and Function of Parts

## 1. Space cleaning system

### Outlet (Automatic louver)

This is used to adjust the air direction.

### Control section panel

Open this panel to access the control section.

### Display

Electrical component box

Electrolysis condition setting switch

Water receptacle

Virus Washer element

Water tank panel

Electrolysis tank

Water tank

Scale filters

Circulation pump

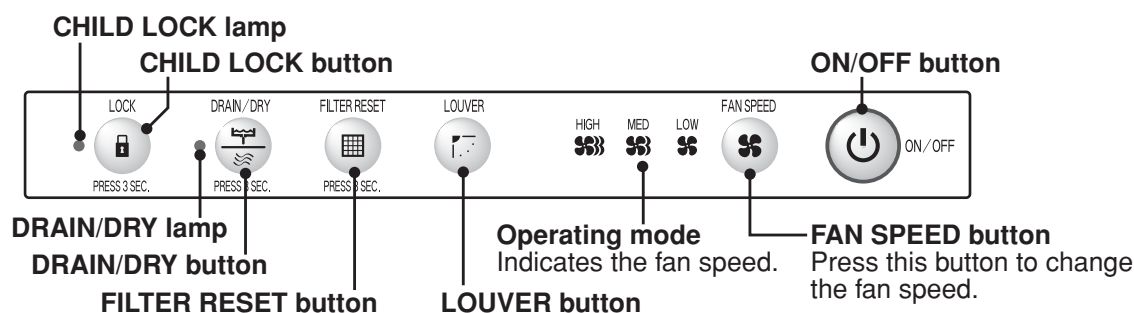
Electrolyzed water tray

Air intake

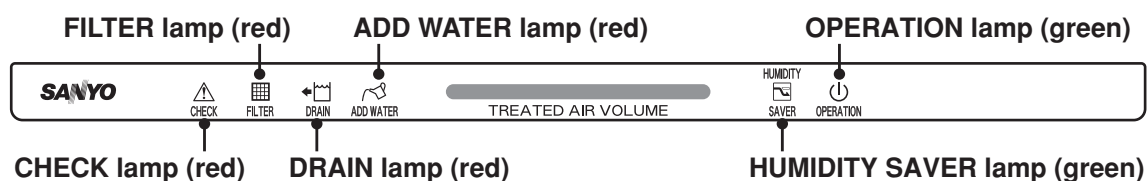
Air intake filter

Drainage tank

## 2. Unit built-in control section



## 3. Unit front display



### ● Indicator lamp display

Indicator lamp status						Meaning
CHECK (red)	FILTER (red)	DRAIN (red)	ADD WATER (red)	SAVER (green)	OPERATION (green)	
—	—	—	—	—	ON	Unit is operating.
—	—	—	—	—	Blinking	Unit is preparing for operation.
—	—	—	—	ON	ON	Reduced water usage is in effect.
—	—	—	ON	—	ON	Water must be added to the water tank.
—	—	ON	—	—	—	Discard the water that has accumulated in the drainage tank.
—	—	—	—	—	—	Water drainage is in progress. The DRAIN/DRY lamp on the control section lights.
—	ON	—	—	—	ON	The filter must be cleaned.
ON	—	—	—	—	ON	The replacement time for electrolysis tank has been reached. Contact the dealer where the system was purchased.
Blinking	—	—	—	—	ON	Error: Contact the dealer where the system was purchased.
—	—	—	—	Blinking	ON	Freeze prevention function has been activated.

### ● TREATED AIR VOLUME indicator

Indicator lamp status	Meaning
	Cleaning of the room* air has started.
	The air in the room has been cleaned 1 time.
	The air in the room has been cleaned 2 times.
	The air in the room has been cleaned 3 times.
	The air in the room has been cleaned 4 times.
	The air in the room has been cleaned 5 times.

\* This is a guide assuming a room floor area of 100 m<sup>2</sup> and a ceiling height of 3 m.

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# 1. Before Using this System

## Checking the installation location

Do not install the system in the following locations:

- **Near curtains, or on carpets**

These items can obstruct the intake and outlet, and can cause system malfunction.

- **High locations, inclined locations, or unstable locations**

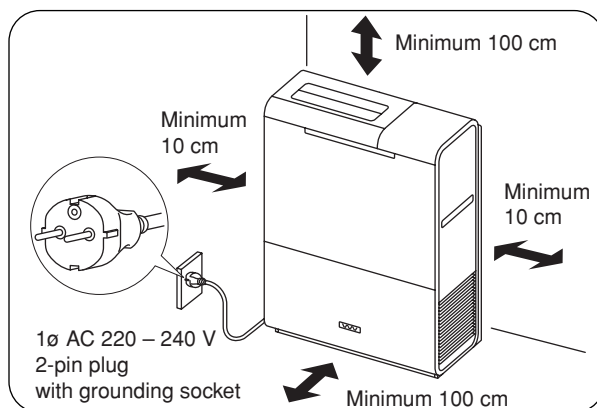
Human contact may cause the unit to fall or tip over. If the unit is installed in an inclined location, the water level sensor may be activated, causing the ADD WATER lamp to light, stopping operation, and resulting in water leakage.



### CAUTION

Be sure to connect the electrical ground wire.

Ensure the space around the unit that is shown in the figure below.



## 1. Setting the electrolysis condition (set by the dealer)

1. Press at the points marked “PUSH” on both sides at the top of the front upper panel, then pull the top of the panel toward you to remove it.



### CAUTION

- When removing the front upper panel, take care not to drop it, and be careful when setting it on the floor.

2. It is necessary to set the optimal electrolysis condition for the tap water to be used by the Virus Washer system. For this purpose, the dealer determines the chlorine ion concentration and the hardness of the tap water, and sets the electrolysis condition according to the figure below.

Tap water with hardness of 400 ppm or more cannot be used because this level of hardness is too high.

Note: Chlorine ions differ from what is ordinarily referred to as “chlorine” (free chlorine).

They are salts in the water that have become ionized.

\*1: In regions where the chlorine ion concentration is 5 ppm or less, add salt to the water tank and use setting No. 7.

\*2: Set the electrolysis condition according to the tap water that is used.

Tap water chlorine ion concentration	Electrolysis condition	Tap water chlorine ion concentration	Electrolysis condition
$5 < X \leq 10$ ppm	No. 6	$20 < X \leq 30$ ppm	No. 4
$10 < X \leq 20$ ppm	No. 5	$30 < X \leq 100$ ppm	No. 3

X: Chlorine ion concentration

(A pen or similar item is useful for turning the knob.)  
(At the time of shipment, this knob is set to “5.”)

Switch No.	Purpose
0	Do not use this setting.
1, 2	Use this setting if there is a strong odor. Ordinarily, this setting is not used.
3 – 6	These are the modes that are ordinarily used.
7	This is the mode for when salt is used.
8, 9	Do not use these settings.

- In regions where the electrolysis condition is 7, turn the electrolysis condition switch knob to “7” and add salt (1 g) to the water tank. (Refer to “Adding salt.”)

## 3. Key points when setting the electrolysis condition

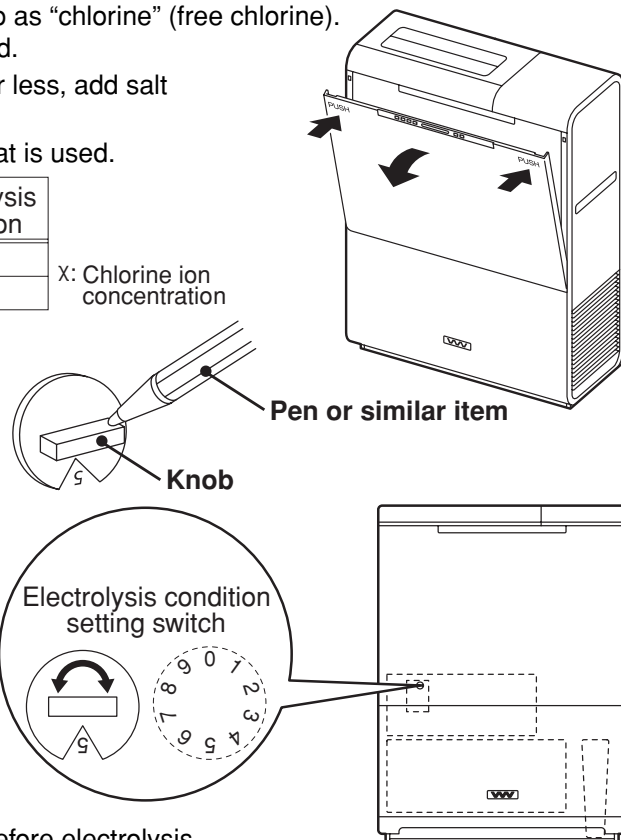
### 1) Room where smoking occurs

More electrolyzed water is consumed in these rooms, therefore electrolysis condition “6” is recommended.



### CAUTION

- This system is not able to break down or remove toxic gasses and substances. Be sure to open a window or otherwise ventilate the interior of the room in the event of a gas or chemical release.
- If the system is used for a long period in a small room, open a window and ventilate the room as necessary.



**4. After setting the electrolysis condition, re-install the front upper panel.**

First engage the bottom hooks, then press simultaneously at the points marked "PUSH" on the top left and right of the panel. A "click" sound should be heard.

**5. Chlorine (disinfectant) odor**

When this product is first used, there may be a disinfectant odor when operation starts. This odor will diminish after the product has operated for a while (approximately a half day). If the odor does not decrease, lower the electrolysis condition setting by 1.

Example: Electrolysis condition setting is "4" → Reduce the electrolysis condition setting to "3."

**Optional Water Filter (Model: VW-WF100BG)**

In regions with higher water hardness levels use one or more optional Water Filter pack(s) to reduce the hardness level of water in the water tank when operating the system.

The water hardness level can be checked by your dealer using a pack tester.

The number of Water Filter packs that should be added depends on the level of water hardness.

(Refer to the chart at right.)

- The time for replacement of Water Filter pack(s) is indicated when the FILTER lamp lights.
- Add the required number of Water Filter packs into the water tank.
- The FILTER lamp turns off when the FILTER RESET button is pressed and held for 3 seconds.

0 ppm < Hardness ≤ 100 ppm: No Water Filter pack is needed.
100 ppm < Hardness ≤ 200 ppm: Add 1 Water Filter pack.
200 ppm < Hardness ≤ 300 ppm: Add 2 Water Filter packs.
300 ppm < Hardness ≤ 400 ppm: Add 3 Water Filter packs.
400 ppm < Hardness: Water of this hardness level cannot be used.

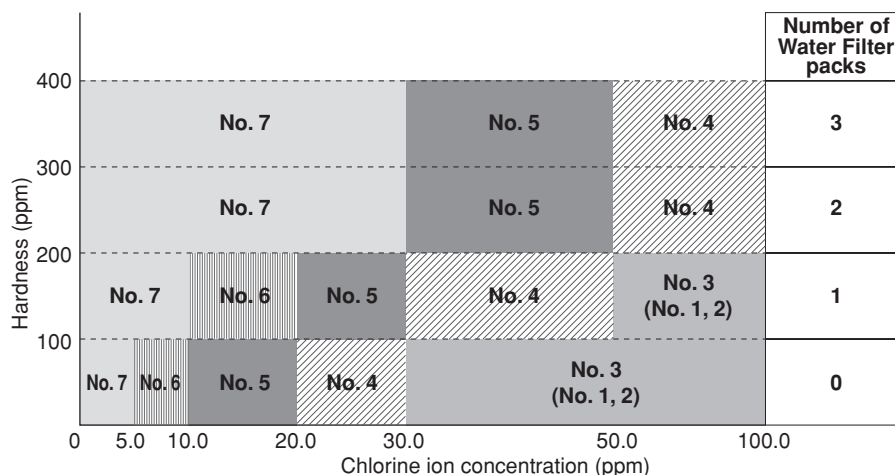


Figure: Electrolysis setting condition and required number of Water Filter packs

**CAUTION**

- Do not cut or tear open the Water Filter pack itself (enclosed in PET mesh), because it contains resin-based filtering material.
- Be careful when handling the Water Filter packs. Released ion-exchange resin material is slippery if it drips on the floor and can cause an accident if not wiped up.

**(1) How to use the Water Filter packs**

- Remove the specified number of Water Filter packs from the plastic bag.
- Take off the water tank cap and put the specified number of packs into the empty tank.
- Fill the water tank with normal tap water.
- Replace the cap and return the water tank to its original position.

**(2) Replacing Water Filter pack(s)**

1. When the FILTER lamp lights, it is time to replace the old Water Filter pack(s).
2. Empty any remaining water, and remove the previously used pack(s) from the water tank.
3. Put the specified number of fresh Water Filter pack(s) into the water tank.
4. Refill the water tank with normal tap water.
5. Replace the cap and return the water tank to its original position.

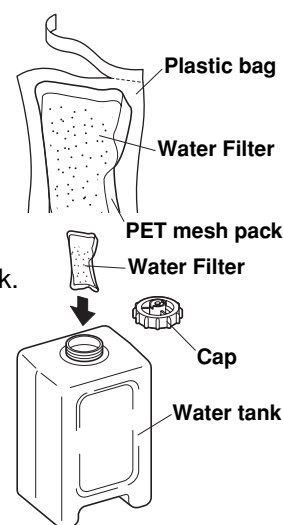
Note: ● You may find that unused Water Filter packs are slightly damp, however this does not cause a problem and they can still be used as-is.

- Never attempt to cut or tear open a Water Filter pack before adding it to the water tank. Doing so will cause the special ion-exchange resin in the pack to mingle with the tank water, resulting in a system malfunction.
- Never put Water Filter packs into any water tanks other than that of the Virus Washer.

**Proper storage of unused Water Filter packs**

Avoid drying out any unused Water Filter packs. Do not open the plastic bag the Water Filter packs came in until you are ready to use them. Any unused packs should be resealed in the plastic bag.

Used Water Filter packs can be disposed of as normal garbage. Do not open them prior to being discarded.



## 2. Filling the water tank

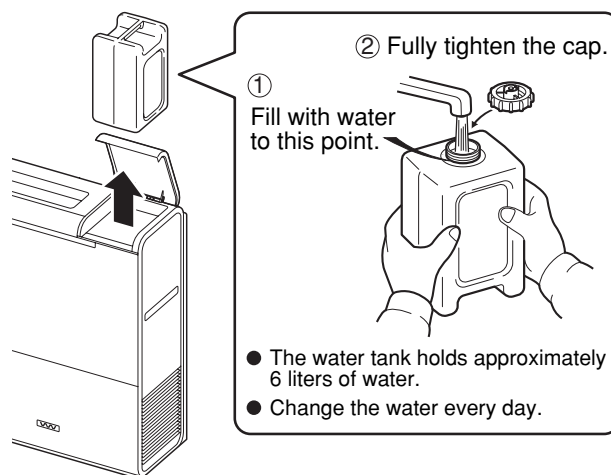
The water supply is necessary in order to generate electrolyzed water.

### CAUTION

- Fill the water tank with new tap water every day, and keep the tank clean at all times.

If water is left in the tank, mold or bacteria may grow in it, resulting in odor.

- \* Be careful that dirt and foreign matter do not enter the tank installation port.



## 3. When the water tank runs dry (when the ADD WATER lamp lights)

When the water tank is empty, operation stops automatically, the ADD WATER lamp lights, and the buzzer sounds to notify the user.



**Fill the water tank with tap water, and insert it into the system, then press the ON/OFF button twice to start operation.**

Pressing this button the first time turns the OPERATION lamp and ADD WATER lamp OFF. Pressing it a second time starts operation. Approximately 3 minutes of preparation are required before the system begins operating. While this preparation is in progress, the fan remains stopped and no air is discharged from the system.

### Important Information

#### Be sure to use normal tap water.

- Never use water from a water purifier, water from a water heater, alkali ion water, mineral water, well water, seawater, or other similar types of water. These types of water cannot be electrolyzed and can result in odor due to mold or bacteria.
- Never use hot (40°C or higher) water, water that contains chemicals, hazy or dirty water, or water that contains aromatics or detergents. These types of water cannot be used to purify the air, and may cause deformation or malfunction of the system.
- Be sure to tighten the cap securely and check that there is no water leakage.
- Place the full tank into the system gently in order to avoid damaging the water tank panel and the electrolyzed water tray.

**The electrolysis condition setting must be set correctly according to the water quality in the region where the product is used. For details, refer to “Setting the electrolysis condition.”**

- Salt must be used in some regions. For details, refer to “Adding salt.”

**When the ADD WATER lamp lights, it is not possible to create electrolyzed water. Therefore refill the water tank with tap water right away.**

- You may also refill the water tank before the ADD WATER lamp lights.

## 2. Precautions for Use

### 1. Before use

Before using the system, the dealer must set the electrolysis condition setting to match the tap water that is used in the customer's region.

Refer to "Setting the electrolysis condition."

Note: "Save" operation is engaged if the room humidity is 80% or higher.

### 2. What to do when the product will not be used for an extended period of time

This product periodically performs automatic cleaning inside the system. Therefore, be sure to observe the following precautions.

- (1) Do not unplug the unit power cord from the outlet.
- (2) Check that the water tank is at least 1/2 full. In particular, if the system will remain stopped continuously for 3 days or longer, be sure that the tank is filled with water.

\* It is recommended that you stop operation, then fill the water tank and place it back in the system.

Cleaning is performed for a certain period even when the ADD WATER lamp is lit. However, if the amount of water in the tank is insufficient, the fan operates automatically to dry the inside of the system. This is not a malfunction.

### Important Information

When first starting a system that has not been used for a long period of time, it is recommended that the water inside the unit be changed. For the water change procedure, refer to "**Draining and Drying Procedure.**"

### 3. Draining

In order to maintain the full Virus Washer capability of this product, water is changed automatically and drainage water accumulates periodically in the drainage tray. When the DRAIN lamp lights, perform the steps listed in "**Draining Procedure.**"

It is possible to continue with operation even when the DRAIN lamp is ON. The sound of running water will occur during drainage. This is not a malfunction. Be sure to dispose of the drainage tank water promptly.

### 4. Odor

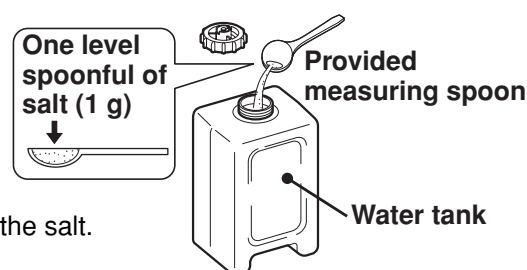
If the water inside the system becomes fouled, a strong chlorine smell may occur. In this case, drain and replace the water inside the system. If the smell does not improve even after the water has been drained, please contact the dealer.

### 5. Adding salt

Salt must be added in regions where the electrolysis condition is 7. When the DRAIN lamp lights, add salt (1 g) to the water tank. In general, this is necessary once or twice each week.

#### ● Adding salt

1. Ready the empty water tank.
2. Remove the water tank cap, and use the provided measuring spoon to add one level spoonful of salt into the tank.
3. After adding the salt, fill the water tank with water.
4. Tighten the cap, and gently shake the tank 2 – 3 times to dissolve the salt.
5. Gently set the water tank in place inside the unit.



### CAUTION

The salt that is added must be composed 99% or more of NaCl. Lower-grade salt (NaCl 95% or more), table salt, rock salt, or other types of salt contain large amounts of impurities and cannot be used.

### 6. Maintenance

The following components require replacement:

- (1) Virus Washer element ... Each year
- (2) Scale filters
- (3) Electrolysis tank ... After about 8 years (assuming 12 hours of use per day and setting at medium (MED) fan speed)

The Virus Washer element and scale filters can be replaced by the customer.

3. Using the System

Plug the power cord into the outlet. (Use an AC 220 – 240 V outlet.)

Important Information

Use a power source that includes a power leakage breaker.

Selecting operation

CHILD LOCK

Press and hold this button for 3 seconds in order to engage the child lock. The CHILD LOCK lamp lights. The child lock disables all button controls except for STOP. To cancel the child lock, press and hold this button again for 3 seconds.

DRAIN / DRY

This can be used to forcefully drain the water from inside the system and begin operation to dry the Virus Washer element.

FILTER RESET

This indicates a guide for when cleaning of the intake filter and scale filters is necessary. After cleaning is completed, press and hold the FILTER RESET button for 3 seconds to turn off the FILTER lamp.

LOCK  
PRESS 3 SEC.

DRAIN / DRY  
PRESS 3 SEC.

FILTER RESET  
PRESS 3 SEC.

LOUVER

HIGH  
MED  
LOW

FAN SPEED

ON / OFF

AIR DIRECTION

Press the LOUVER button to cause the louver to swing. When the louver has reached the desired position, press this button again to stop the louver. The louver will automatically be fixed in this position the next time the system is operated.

MODE CHANGE

The fan speed changes each time the FAN SPEED button is pressed.

STARTING

Press the ON/OFF button.  
When this button is pressed, the OPERATION lamp begins blinking and the system begins preparing for operation (3 minutes). During this preparation, the fan remains stopped and no air is discharged. When preparation is complete, the OPERATION lamp stops blinking and remains lit, and operation starts.

STOPPING

Press the ON/OFF button.  
● If the system does not stop  
If the normal method fails to stop the unit, pull out the power plug and contact the dealer where the system was purchased.

CAUTION

1. If the system is used at the HIGH fan speed, the air throughout the room will be purified more quickly. When the system is first used, it is set to MEDIUM fan speed.

2. Automatic cleaning operation function  
Even when this product is stopped, it performs automatic cleaning operation in order to ensure that the inside of the system remains clean. **Because this cleaning operation is started automatically, leave the product plugged in and make sure there is sufficient water in the water tank** when the product is stopped, on weekends and holidays, and during other brief periods when it will not be operated.

3. The SAVER lamp lights when the room humidity is 80% or higher, and the fan changes to LOW speed.

Water refill

Winter		Summer	
HIGH .....Approx. 6 hours	The times at left are an approximate guide for water refill during winter (at a room temperature of 20°C and 30% humidity).	HIGH .....Approx. 7 hours	The times at left are an approximate guide for water refill during summer (at a room temperature of 27°C and 47% humidity).
MED .....Approx. 10 hours		MED .....Approx. 12 hours	
LOW .....Approx. 15 hours		LOW .....Approx. 18 hours	

2 - 6

## 4. Draining Procedure

Water is automatically drained to the drainage tank in order to prevent fouling of the electrolyzed water inside the product and to maintain the Virus Washer capability. When the DRAIN lamp lights, follow the procedure below and dispose of the water in the drainage tank.

### Draining water from the drainage tank (when the DRAIN lamp is ON)

When the drainage tank becomes full, the DRAIN lamp lights, and the system stops operating.



2

- 1. Stop the system. Then open the lower part of the front panel.**  
Press at the points marked "PUSH" on the top left and right of the front lower panel, then tilt it toward you to remove it.

#### CAUTION

- When removing the front lower panel, take care not to drop it, and be careful when placing it on the floor.

- 2. Remove the drainage tank and empty the water from the tank.**

Pull the handle of the drainage tank toward you to remove the tank.

The tank will be full of water up to the lid. In order to avoid spilling water, grasp the handle and carry the tank so that it remains level.

#### CAUTION

- Before removing the drainage tank, verify that the system is stopped (the OPERATION lamp is not lit).

- 3. When draining the water, do not open the tank lid. Empty the tank through the rectangular hole at one end of the lid.**

When all the water has been poured out, place the drainage tank back in its original position.

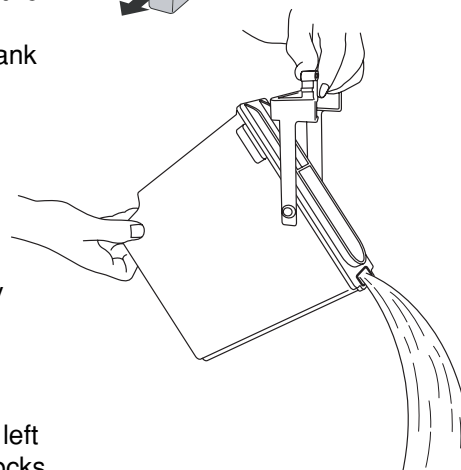
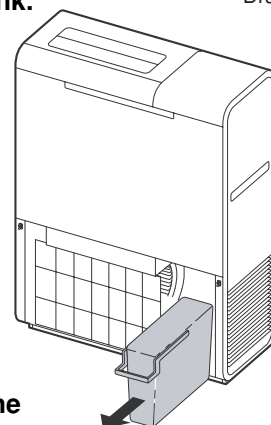
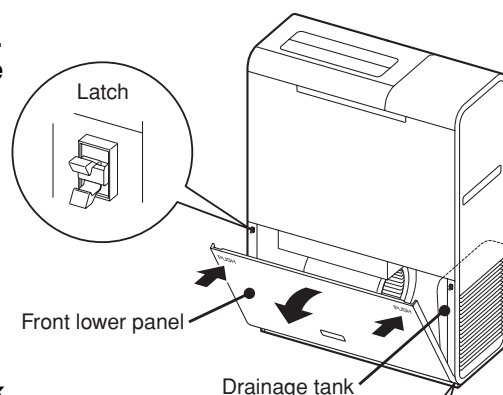
- 4. Insert the tank all the way into the unit.**

Verify that the DRAIN lamp has turned OFF.

If the DRAIN lamp is not OFF, again insert the tank all the way to the inside.

- 5. Return the front lower panel to its original position.**

First engage the bottom hooks on the front lower panel, then press simultaneously at the points marked "PUSH" on the top left and right of the panel. A "click" sound occurs when the latch locks.



### If draining cannot be done immediately when the DRAIN lamp lights

The drainage tank must be drained when the DRAIN lamp lights. Drain the water as soon as possible. However the unit is able to operate for a short period even after the DRAIN lamp lights.



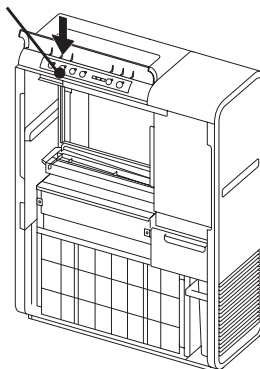
## 5. Draining and Drying Procedure

Perform draining and drying if the system is relocated or stored without being operated for a long period of time.

### Draining and drying procedure

1. Set the fan speed to be used for drying.  
After setting the fan speed to "High," press the ON/OFF button to stop operation.
- ↓
2. Remove the water tank and empty the water from of it.
- ↓
3. Press and hold the **DRAIN/DRY** button for 3 seconds.  
The DRAIN/DRY lamp lights, and the water in the system flows into the drainage tank.
- ↓
4. After waiting approximately 2 minutes, press the **DRAIN/DRY** button again.  
This begins drying of the Virus Washer element.
- ↓
5. The fan starts operating. (The fan speed is "High.")  
The "TREATED AIR VOLUME" sign begins blinking.
- ↓
6. If the system is to be relocated, leave it operating for approximately 20 minutes.  
If the system is to be stored, leave it operating for approximately 2 hours.  
(This is necessary make the Virus Washer element fully dry.)
- ↓
7. Press the **DRAIN/DRY** button again.  
The fan stops and the "TREATED AIR VOLUME" sign turns OFF.
- ↓
8. Remove the front lower panel and empty the drainage tank. (Refer to "Draining Procedure.")
- ↓
9. Return the drainage tank and water tank to their original positions.  
Verify that the DRAIN lamp has turned OFF.  
If the DRAIN lamp is not OFF, again insert the tank all the way to the inside.
- ↓
10. Re-install the front lower panel, and relocate or store the system.

DRAIN/DRY button



2

### CAUTION

- It is not possible to drain the system water when the water tank is installed.  
Be sure to remove the water tank.

## 6. Troubleshooting

### 1. Error notification

The CHECK lamp on the display blinks to indicate an error.

For servicing, contact the dealer where the system was purchased.

### 2. The following conditions are not malfunctions.

**Before requesting servicing, check the following. If the problem is still not corrected, contact the dealer where the system was purchased.**

Trouble	Cause	Correction
No lamps light when the ON/OFF button is pressed.	Has the power plug come out of the socket?	Securely insert the power plug all the way to the base and press the ON/OFF button.
The ADD WATER lamp is ON.	There is no water in the water tank.	Add tap water to the water tank, and press the ON/OFF button again.
The ADD WATER lamp is ON although there is water in the water tank.	Did you press the ON/OFF button again?	Press the ON/OFF button again.
There is an odor in air coming from the outlet.	Is old water being used? (Has the DRAIN lamp been ON for a long period of time?)	Perform draining and drying. Clean the intake filter.
	Have the filters or electrolyzed water tray become fouled?	
There is a chlorine smell when the system is first used, or when operation starts.	This is caused by the generation of electrolyzed water.	The odor will diminish when the system has operated for some time. (approximately one-half day) If the odor does not diminish, change the electrolysis condition setting.
A bubbling sound can be heard.	This is the sound of water being supplied from the water tank.	This is not a malfunction. Continue to use the system as-is.
A humming sound can be heard.	This is the sound of the fan operating.	
No air comes out of the outlet.*	Have 3 minutes passed since the ON/OFF button was turned ON?	The fan will start when approximately 3 minutes have passed.
The SAVER lamp is ON. (The fan speed is reduced.)	Is the room humidity 80% or higher?	When the room humidity falls to 70% or lower, the original fan speed will be restored.
There is the sound of running water.	This is the sound of water draining to the drainage tank.	Dispose of the water in the drainage tank.

\* If no air is emitted when 3 minutes have elapsed after the ON/OFF button was pressed, contact the dealer where the system was purchased.



### WARNING

#### Do not disassemble or modify.

- Do not disassemble or modify this system. **Doing so may result in fire, electric shock, or injury.**



## 7. Trouble Diagnosis

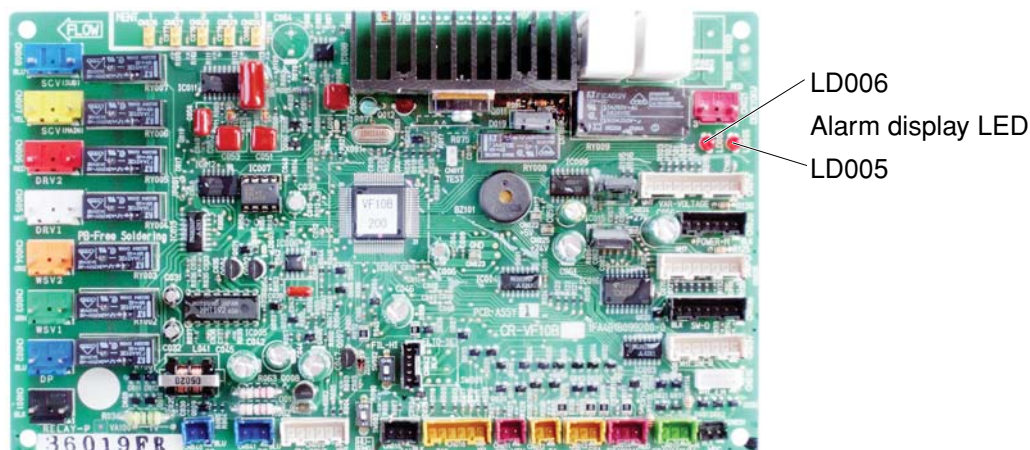
### Problems and locations to inspect

Alarm	Alarm code	Alarm display LED		Alarm description	Probable cause	Inspection location / method	Correction
		LD005	LD006				
–	–	–	–	(Does not operate.)	The power supply to the indoor unit has failed.	Check that the power breaker is ON.	Turn the breaker ON.
F10	6A	Blinks 6 times.	Blinks 10 times.	Trouble with the intake temperature sensor	The intake temperature sensor connector is not correctly connected to the control PCB, or the sensor has failed.	Check that the intake temperature sensor is correctly connected to the control PCB, and check that there is no short circuit in the sensor.	Connect the connector correctly or replace the sensor.
F12	6C	Blinks 6 times.	Blinks 12 times.	Failure of the air purification system EEPROM	The humidity sensor connector is not correctly connected to the control PCB, or the sensor has failed.	Check that the humidity sensor is correctly connected to the control PCB, and check that there is no short circuit in the sensor.	Connect the connector correctly or replace the sensor.
F15	6F	Blinks 6 times.	Blinks 15 times.	Trouble with the electrolysis unit water temperature sensor	The electrolysis unit water temperature sensor connector is not correctly connected to the control PCB, or the sensor has failed.	Check that the electrolysis unit water temperature sensor is correctly connected to the control PCB, and check that there is no short circuit in the sensor.	Connect the connector correctly or replace the sensor.
F29	7D	Blinks 7 times.	Blinks 13 times.	Trouble with the humidity sensor	Writing to the EEPROM on the control PCB is not possible.	Turn the power OFF and back ON, and check whether alarm F29 occurs again.	Replace the EEPROM.
P12	EC	Blinks 14 times.	Blinks 12 times.	Trouble with the DC fan	The DC fan motor connector is not correctly connected to the control PCB, or the DC fan motor has failed.	Check that the DC fan motor is correctly connected to the control PCB.	Connect the connector correctly or replace the DC fan motor.
J10	AA	Blinks 10 times.	Blinks 10 times.	Abnormal electrolysis unit water temperature	There is no water in the electrolysis unit, due to trouble with the pump or water circuit.	Check that the pump is circulating water correctly, check that the float switch is functioning correctly, and check that the water temperature sensor is installed correctly.	Replace the float sensor or the pump, or install the water temperature sensor correctly so that it functions correctly.
J11	AB	Blinks 10 times.	Blinks 11 times.	Abnormal conductivity	Because the electrolysis unit connector has become disconnected, the system has judged that there is no water in the electrolysis tank.	Check that the electrolysis unit connector is correctly connected to the control PCB, and check that the pump is sending water to the electrolysis unit.	Connect the connector correctly, replace the pump, or replace the control PCB.
J12	AC	Blinks 10 times.	Blinks 12 times.	Abnormal electrolysis current value	An abnormal current value was detected during electrolysis control.	Check for displaced electrodes inside the electrolysis unit.	Check that no electrodes are displaced inside the electrolysis unit, replace the electrolysis unit, or replace the control PCB.

#### ■ Alarm display

- If an alarm occurs while the system is operating, the alarm display LED on the unit display will blink at 1-second intervals (0.5 seconds ON, 0.5 seconds OFF) for the number of times that corresponds to the alarm code.
- When facing the control PCB, the LED on the LD005 indicates the first digit, and the LED on the LD006 indicates the second digit.

For example, when alarm F10 occurs, the alarm code is 6A. Therefore, the LED for the first digit blinks 6 times, then the LED for the second digit blinks 10 times.



## 8. Cleaning the System

Perform cleaning of the system regularly. If the system becomes particularly dirty, performance may decline, the system may malfunction, or odors may occur.



### WARNING

- Unplug the power cord when cleaning the system.
- Do not use chlorine-based or acidic detergents when cleaning the water tank, unit, or filters.

#### Before cleaning

**Be sure to stop operation and unplug the power cord.**



### CAUTION

The fan inside the system turns at high speed, and may cause injury.

**Do not use water that is 40°C or warmer.**

Doing so may result in deformation or discoloring.

**Do not use volatile substances.**

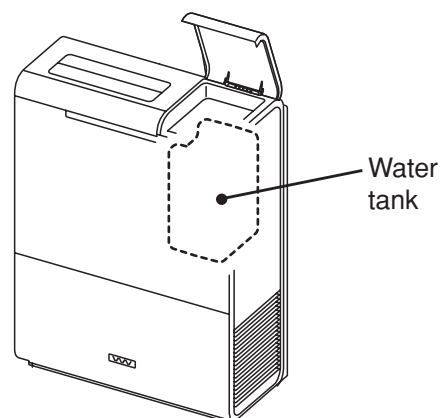
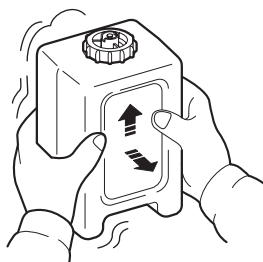
Do not wipe with benzene, paint thinner, alkali detergents, cleansers, scouring powder, or similar substances, and do not apply commercially available liquid insecticides or similar substances. Doing so may result in deformation or discoloring. In addition, if using a chemical wipe, follow the precautions for that product.

#### Cleaning the unit (when it is dirty)

- Wipe with a soft cloth that has been soaked in water.
- If the unit is particularly dirty, use a soft cloth soaked in a neutral (non-acidic) detergent diluted with water. Wring the cloth out well before wiping off the dirt. Then wipe again with a cloth soaked in water.

#### Cleaning the water tank (every day)

Put a small amount of water in the tank, tighten the cap, and shake to rinse. Keep the water tank clean at all times. Be sure to use tap (drinking) water when filling the tank.



#### Cleaning the drainage tank (when disposing of the water)

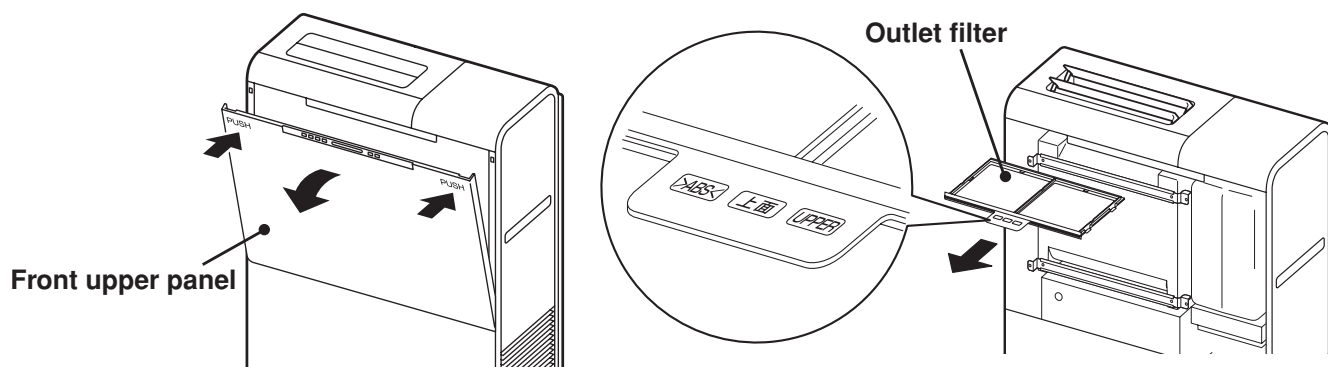
After disposing of the water in the tank, use tap water to rinse the tank out.

## Cleaning the outlet filter and intake filter (when dust becomes noticeable or when the FILTER lamp is ON)

### ● Outlet filter

Remove the front upper panel and remove the outlet filter.

Use a vacuum cleaner to remove the dust, then re-install the filter with the top side of the filter facing upwards.



### ● Pre-filter and high collection filter

Remove the front lower panel.

Turn the left and right knobs and remove the two intake filters.

Use a vacuum cleaner to remove the dust, or wash with water.

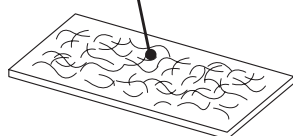
After washing, dry the filter thoroughly in shade.

Re-install the high collection filter with the side where "TO FACE FAN" is printed facing toward the unit (the fan).

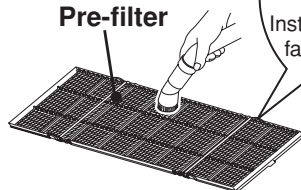
### ⚠ CAUTION

- If the surface of the high collection filter is facing the wrong way, air intake may be impeded, resulting in lower air discharge and increased noise.

High collection filter



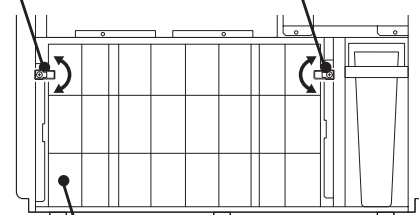
Pre-filter



Front lower panel

Knob

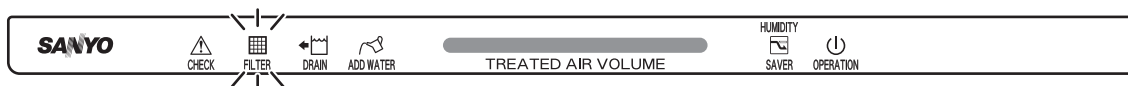
Knob



Pre-filter

- After cleaning the filters and returning them to their original positions, press and hold the RESET button for 3 seconds.

The FILTER lamp will turn OFF.



## Important Information

Do not use this system with the filter removed. Doing so may result in malfunction.

## 9. Storage (when the system will not be used for an extended period of time)

### When the system will not be used for an extended period of time

Perform draining and drying. (Refer to the previous section "Draining and Drying Procedure.")

## 10. Replacing Consumable Parts

### Replacing the electrolysis tank (when the OPERATION and CHECK lamps are blinking simultaneously)

#### Replace the electrolysis tank (at charge to the customer).

Request replacement from the dealer where the system was purchased.

\* Electrolysis tank ... After about 8 years (assuming 12 hours of use per day and setting at medium (MED) fan speed)

If you continue to use the product without replacing the electrolyzing unit, the electrolyzed water concentration will decrease and performance will decline.

### Replacing the Virus Washer element

Replace the Virus Washer element. The Virus Washer element can be replaced by the customer, however it is recommended that a contract for regular maintenance be arranged.

Replacement (at charge to the customer) is required once a year.

Request replacement from the dealer where the system was purchased.

#### 1. Stop the system and unplug the plug. Then disconnect the top of the front panel.

Press at the points marked "PUSH" at the top left and right of the front panel, then pull the top of the panel toward you to remove it.

#### 2. Remove the 4 screws and remove the housing (styrofoam).

The DRAIN/DRY lamp turns OFF.



#### CAUTION

- Verify that the system is stopped.

#### 3. Remove the outlet filter case.

(1) Press inward to disengage the front tab.

(2) Pull downward.

#### 4. Remove the holding bracket.

Remove the 2 screws.

#### 5. Disconnect the tube from the joint.

Press evenly on both arrows to disengage the lock.

Then pull out the tube. The tube cannot be disconnected when only one side is pressed.

#### 6. Remove and replace the element.

Wipe off the fouling and scale that has accumulated in the grooves of the electrolyzed water tray.

#### 7. Disconnect the joint from the Virus Washer element.

Pull out the joint while pressing on the stopper at the joint base. Insert the removed joint into the new Virus Washer element, inserting it all the way to the base.



#### CAUTION

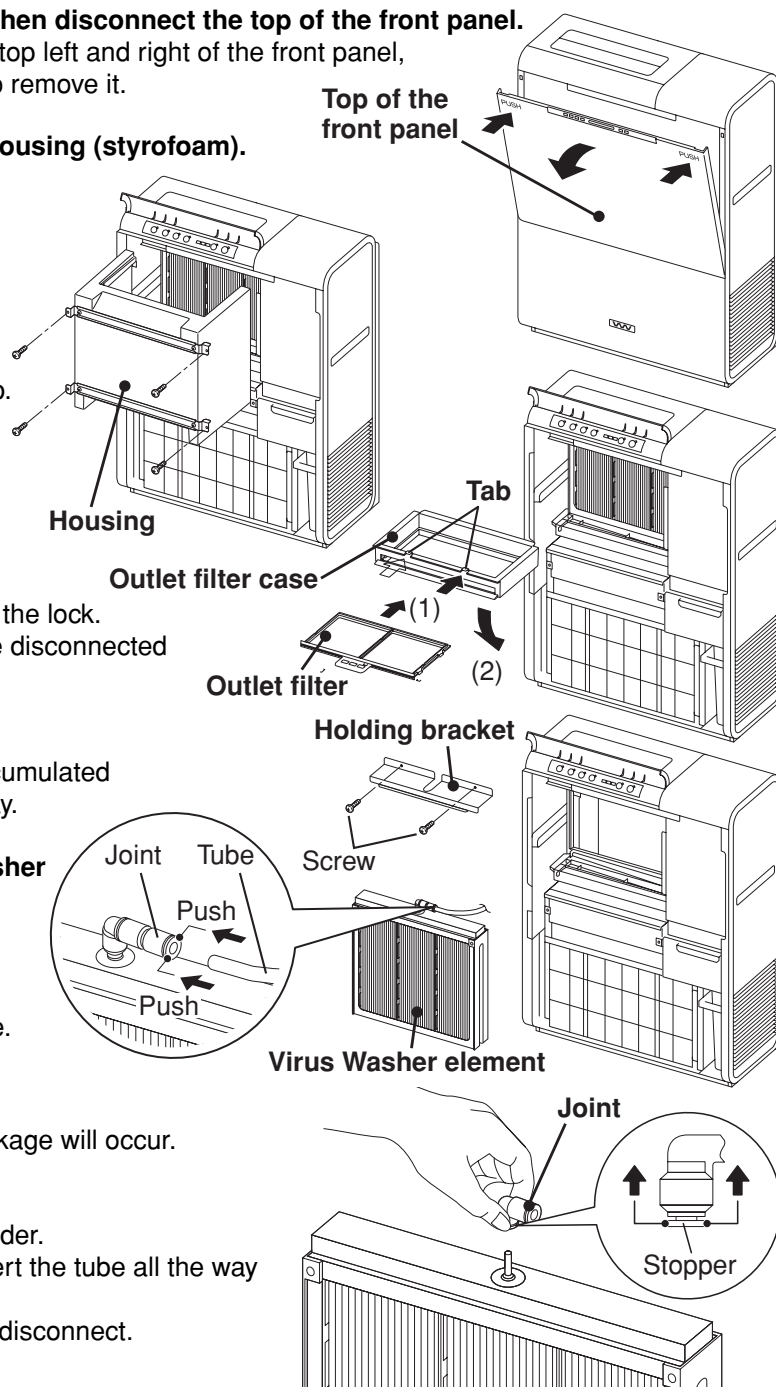
- If the joint is not fully inserted, water leakage will occur.

#### 8. Re-install the Virus Washer element.

Follow the disassembly steps in reverse order.

When connecting the tube to the joint, insert the tube all the way until the end of the tube makes contact.

Pull on the tube and verify that it does not disconnect.



## Replacing the scale filters

When the FILTER lamp lights, wash the scale filters.  
If the filters are particularly dirty, replace them with new filters (at charge to the customer).

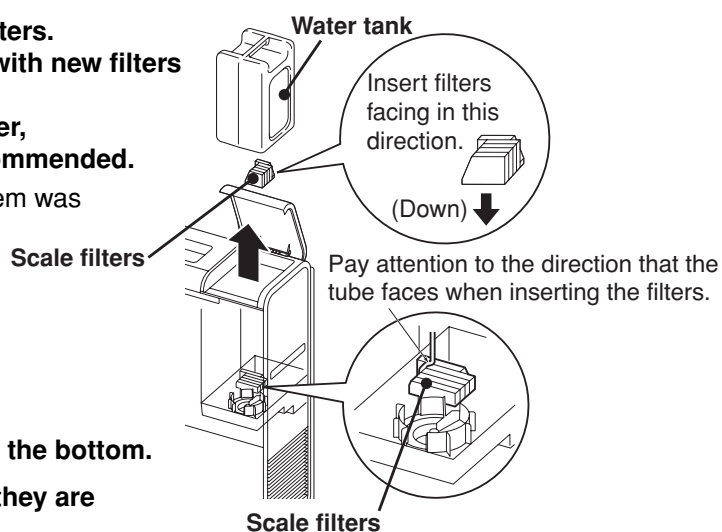
**The scale filters can be replaced by the customer, however a regular maintenance contract is recommended.**

Request new filters from the dealer where the system was purchased.



### CAUTION

- Verify that the system is stopped.
- 1. Remove the water tank.
- 2. Pull out the scale filters (6 filters) located on the bottom.
- 3. Insert the new scale filters, taking care that they are facing in the correct direction.



## 11. Declaration of Conformity

This product is marked “CE” as it satisfies EEC Directive No. 89/336/EEC, 73/23/EEC and 93/68/EEC, and conforms with relevant standards.

This declaration will become void in case of misuse and/or from non-observance of manufacturer's installation and/or operating instructions.

## CONTENTS

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### 3. MEASURING THE WATER SAMPLE

- 1. Measuring the Electrolyzed Water Concentration ..... 3-2
- 2. Electrolyzed Water Concentration Measuring Tools ..... 3-4



# 1. Measuring the Electrolyzed Water Concentration

Adjust so that the electrolyzed water concentration is within the prescribed range in order to maintain the performance of the space cleaning system.

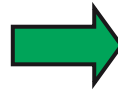
## (1) Preparing to measure the concentration

After replacing the Virus Washer element and scale filters, and after cleaning the electrolyzed water tray, fill the water tank with water and install it in the unit. Next, press the ON/OFF button and turn the system ON, then OFF. Cleaning operation will begin immediately. Wait approximately 20 minutes, until the circulating pump stops operating.

## (2) When the cleaning operation has finished, use the syringe (for the water sample) and obtain 1 mL of water from the electrolyzed water tray. Add the water into the container that is supplied with the residual chlorine concentration meter.



Sampling the circulation water

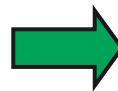


Add the water sample into the container supplied with the residual chlorine concentration meter.

## (3) Use the syringe (for purified water) and obtain 9 mL of purified water. Add this purified water into the container that is supplied with the residual chlorine concentration meter, and mix it with the water sample.



Obtaining purified water



Add the purified water into the container supplied with the PDP.

## (4) Insert the provided container into the residual chlorine concentration meter, and press the "ZERO" button.



Verify that the reading is 0.

- (5) When the zero-check is completed, add the reagent into the residual chlorine meter container, then mix well for approximately 20 seconds.



Add the total chlorine reagent that was specified by the manufacturer of the residual chlorine concentration meter.

- (6) Place the container into the residual chlorine meter again and measure the concentration. The measured value multiplied by 10 is the hypochlorous acid concentration.



The displayed value is the measurement value.

- (7) The hypochlorous acid concentration shows normal values if it is within the designated range of 2 – 5 ppm.
- (8) If the hypochlorous acid concentration is not within the designated range (2 – 5 ppm), change the electrolysis condition according to the table below and replace the water in the electrolyzed water tray. Then measure the concentration again.

■ Judging the hypochlorous acid concentration

- Standard range: over 2 – 5 ppm
- If the measured concentration is not within the standard range (2 – 5 ppm), change the electrolysis condition according to the table below.

Measured concentration < 2 ppm		5 ppm < measured concentration	
Old setpoint	New setpoint	Old setpoint	New setpoint
No. 1	No. 2	No. 2	No. 1
No. 2	No. 3	No. 3	No. 2
No. 3	No. 4	No. 4	No. 3
No. 4	No. 5	No. 5	No. 4
No. 5	No. 7 *1	No. 6	No. 4
No. 6	No. 7 *1	No. 7	No. 6

\*1: If setting this point, dissolve 1 g of salt in the water tank before inserting the tank into the unit.



## 2. Electrolyzed Water Concentration Measuring Tools

Prepare the following instruments, parts, and materials before starting.

- (1) Residual chlorine concentration meter  
(Example: Pocket calorimeter produced by Hach)



- (5) 10 mL syringe  
(for purified water: used to dilute the concentration)



- (2) Total chlorine reagent  
(Reagent designated by the manufacturer of the residual chlorine concentration meter)



- (6) 1 mL syringe  
(for the water sample)



- (3) Container for measuring the water sample concentration  
Container provided with the residual chlorine concentration meter



- (7) Purified water  
(Approximately 500 mL of purified water is used to dilute the water sample. Sterile water for contact lenses may also be used.)

- (4) Container for dividing the purified water beaker  
(approximately 50 mL)



- (8) Bucket  
(1 – 3 L: for a drainage container)

CONTENTS

4. SPECIFICATIONS

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2. Part Specifications ..... 4-3

3. Control Specifications ..... 4-3

4. Electric Wiring Diagram ..... 4-4

# 1. Product Specifications

Model name			Virus Washer System (Floor-Mounted)	
General Model No.			VW-VF10BG	
External dimensions	Height	mm	790	
	Width	mm	580	
	Depth	mm	297	
Net weight		kg	33	
Operating weight		kg	39 (when water tank is full)	
Shipping weight		kg	36	
Shipping volume		m <sup>3</sup>	0.24	
Water tank capacity		L	Approx. 6	
Exterior color (Munsell number)		—	Front panel: NW-K11 (VW white), Munsell value N8.5 Side panels: NW-K12 (VW gray), Munsell value N4.0	
Power source		—	Single-phase, 220 – 240 V, 50 / 60 Hz	
Suitable floor space (approximate)		m <sup>2</sup>	100	
Power cord length		m	1.7 (parallel plug with grounding contact)	
Operation	Control section		ON/OFF, FAN SPEED, LOUVER, FILTER RESET, CHILD LOCK, DRAIN/DRY	
	Display (LED lamps)		OPERATION, HUMIDITY SAVER, ADD WATER, DRAIN, FILTER, CHECK, TREATED AIR VOLUME	
	Operating modes		HIGH / MEDIUM / LOW	
	Service temp. range		5 – 35°C	
	Water used		Tap water (drinking water) *1	
Electrical characteristics	Power consumption		HIGH: 150 / MEDIUM: 80 / LOW: 70	
	Current value		HIGH: 2.10 / MEDIUM: 1.20 / LOW: 0.88	
Fan device	Model × Quantity		Sirocco fan × 1	
	Rated airflow		HIGH: 10 / MEDIUM: 5 / LOW: 2	
	Motor output (No. of electrodes)		60 (8 electrodes)	
	Louver		2-flap louver (with swing function, fully closed when stopped)	
	Air direction adjustment range		0° – 23° (with air direction position memory)	
Continuous operating time *3	Summer	h	12 (MEDIUM operating speed, air conditions: DB 27°C, RH 47%)	
	Winter	h	10 (MEDIUM operating speed, air conditions: DB 20°C, RH 30%)	
Protective device		—	Protective thermostat, fuse	
Water level detection		—	Float SW, reed SW	
Sensors		—	Room temp. sensor, water temp. sensor, humidity sensor	
Air filters		—	Pre-filter (intake side) + High collection filter (intake side) (collection efficiency: 76% by weight method)	
Scale filters		—	Non-woven cloth filters (composed of 5 layers)	
Virus Washer element		—	Stationary type	
Operating noise		dB (A)	HIGH: 49 / MEDIUM: 35 / LOW: 29 *2	
Water supply method		—	Water tank (capacity approximately 6 L)	
Drainage method		—	Drainage tank (capacity approximately 2 L)	
Primary accessories			Tip-over prevention chain, Instruction Manual, Installation Instructions, measuring spoon	
Other accessories (options)				
High collection fine-particle filter				
Model No.			AFT-HVW10B	
Collection efficiency		%	Equivalent to 65% by colorimetric method (equivalent to 93% by weight method)	
Rated airflow		m <sup>3</sup> /min	HIGH: 8 / MEDIUM: 5 / LOW: 2	
Operating noise		dB (A)	HIGH: 49 / MEDIUM: 39 / LOW: 29 *2	

- Be sure to use normal tap water. Using well water or purified water as-is may cause system failure.
- In order that this product can remain in good condition and provide many years of reliable service, consumable parts must be replaced regularly. For details, refer to “Replacing Consumable Parts” in the Instruction Manual that was provided with the system.
- If the high collection filter is installed, the airflow will be decreased.

\*1: Be sure to use normal tap water (drinking water). Depending on the water quality in your area, it may be necessary to change the system settings. In addition, the tap water in certain areas cannot be used as-is. For details, refer to “Setting the Electrolysis Condition” and “List of Water Quality Regions” in the Instruction Manual that was provided with the system.

\*2: The operating noise was measured in an anechoic chamber. Therefore it is the value at a position 1 m in front of the system and a height of 1 m. When the unit is actually installed, ambient noise and noise reflection ordinarily result in noise that is greater than the value indicated here.

\*3: Continuous operating time refers to the operating time when the water tank is full (6 L).

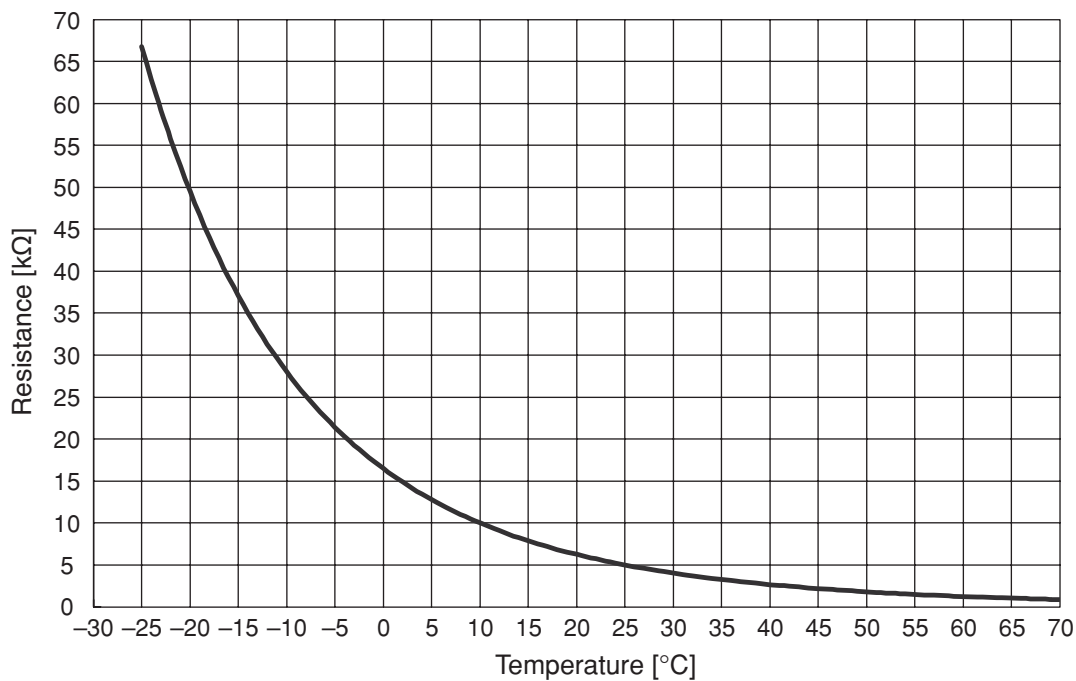
## 2. Part Specifications

### ● Fan motor coil resistance

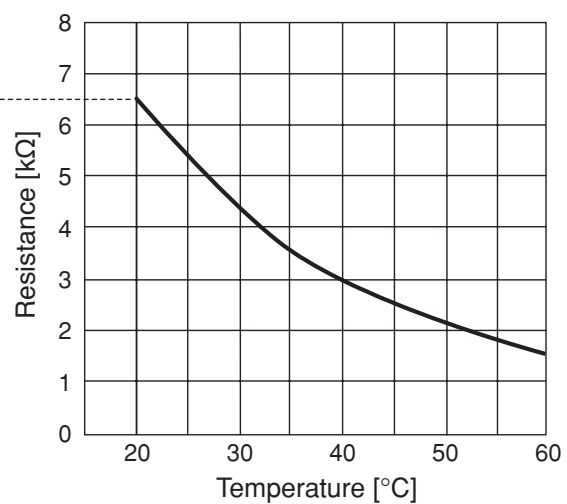
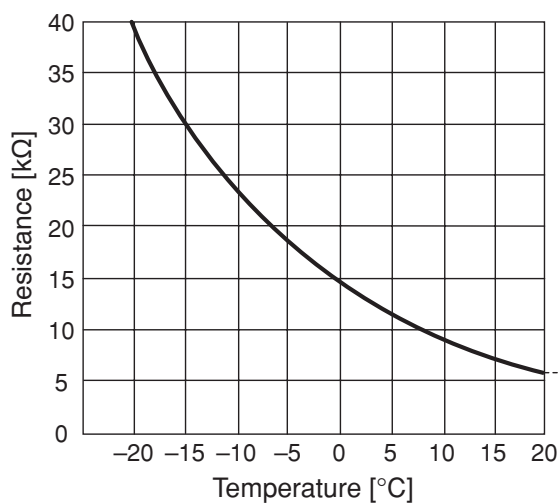
Model No.	DK8-63F280H		
Resistance ( $\Omega$ ) (at 20°C)	Red – White	26.6	
	White – Blue	26.6	
	Blue – Red	26.6	

### ● Thermistor characteristics

Intake temperature sensor



Electrolyzing unit water temperature sensor

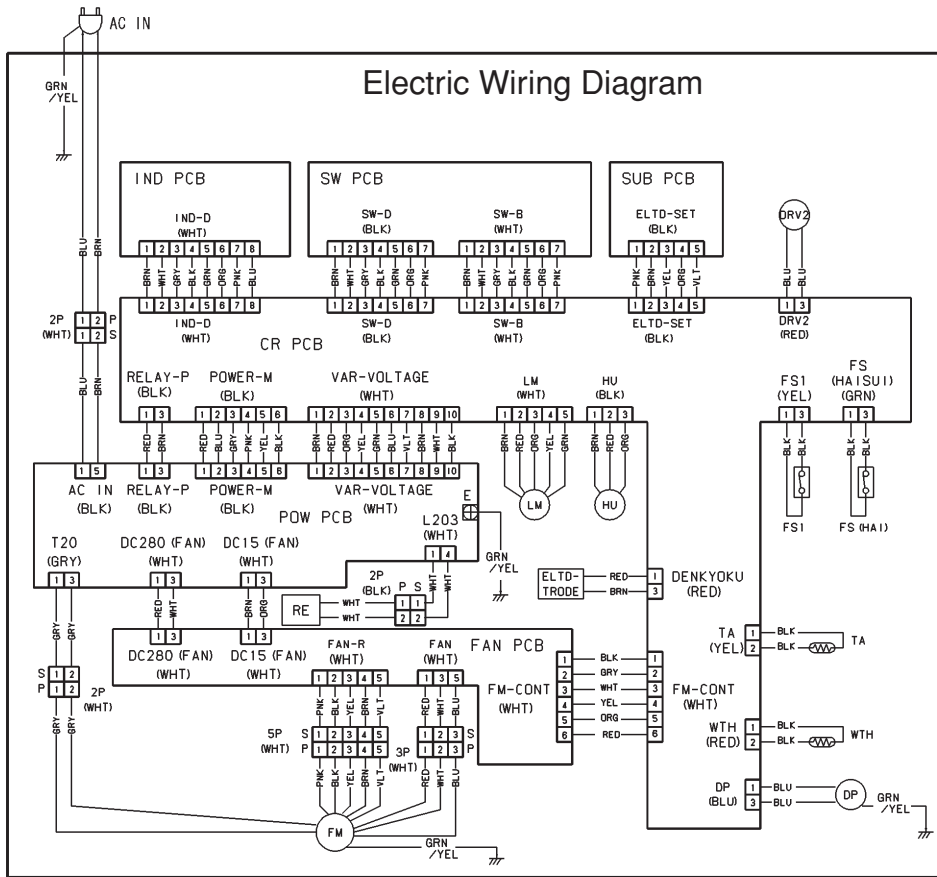


## 3. Control Specifications

Microcomputer control: Settings : Fan speed select (HIGH, MEDIUM, LOW)  
 Service functions: Alarm display

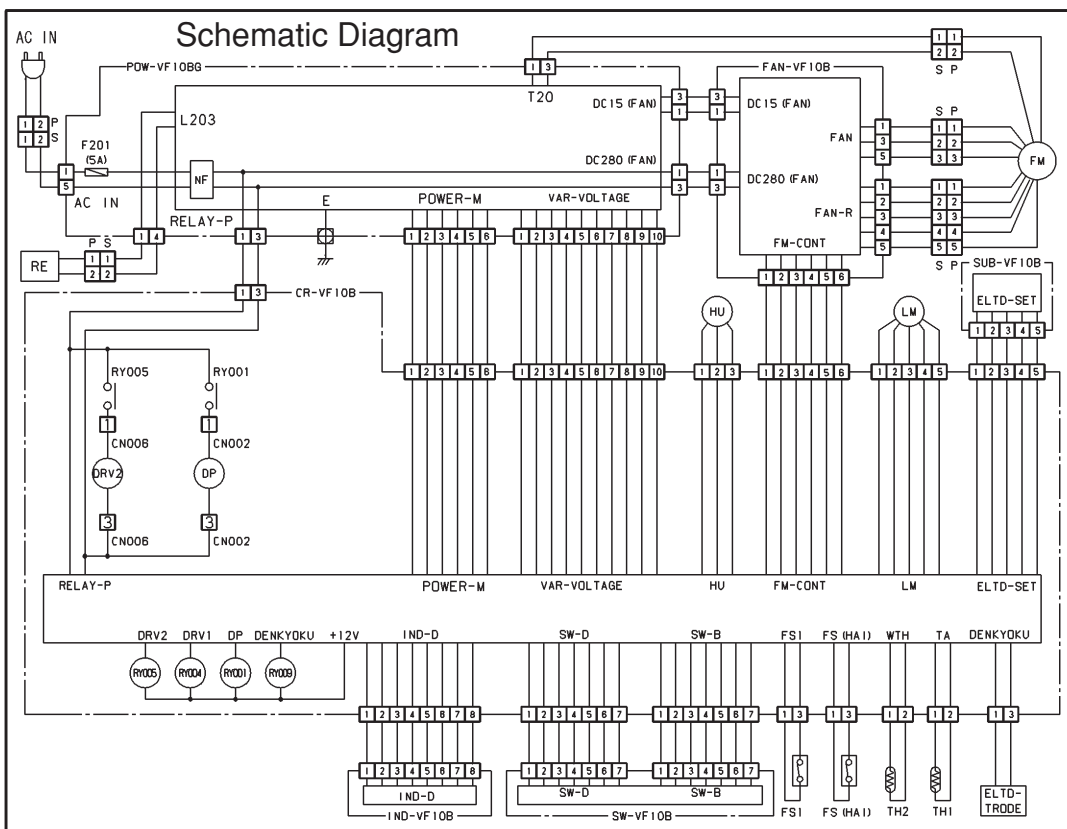
## 4. Electric Wiring Diagram

8FA-2-5250-140-00-2



SYMBOLS	DESCRIPTION
FM	Fan motor
DRV2	Drain valve
DP	Drain pump
FS (HAI)	Float switch (FLUSH)
FS1	Float switch 1
RY001 – 005, 009	Relay
TH1	THERMISTOR (ROOM Temp.)
TH2	THERMISTOR (WATER Temp.)
RE	REACTOR
ELTD-TRODE	Electrode
LM	Louver motor
HU	Humidity sensor
CR-VF10B	Control PCB
POW-VF10BG	Power PCB
FAN-VF10B	Fan PCB
IND-VF10B	IND PCB
SW-VF10B	SW PCB
SUB-VF10B	Sub PCB
	Thermistor
	Connector
	Terminal

Note: When replacing a PCB, first turn OFF the power and verify that all lamps on the control PCB have turned OFF before starting work. Performing this work while the lamps are lit will result in electric shock.



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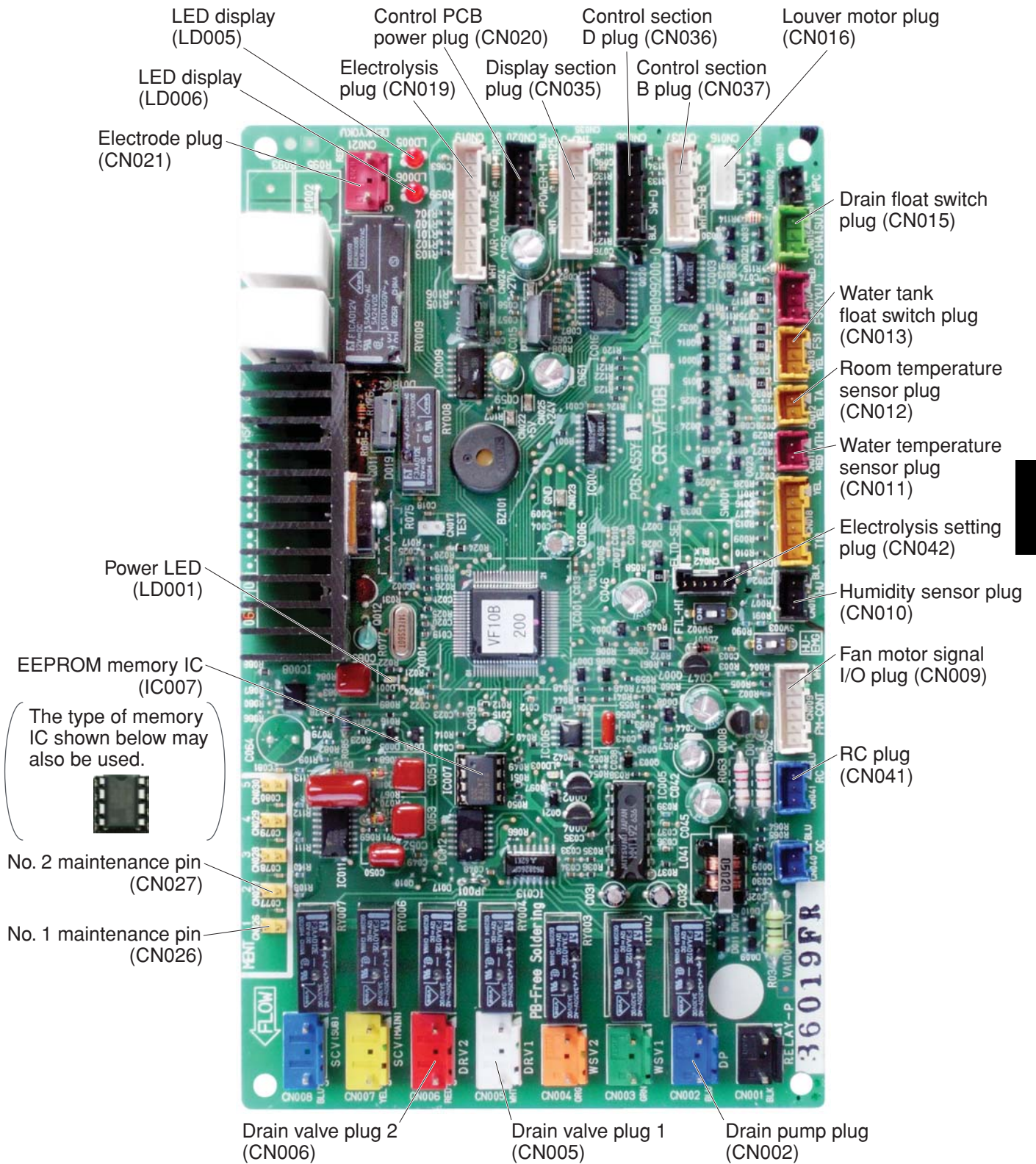
## 5. PCB AND FUNCTIONS

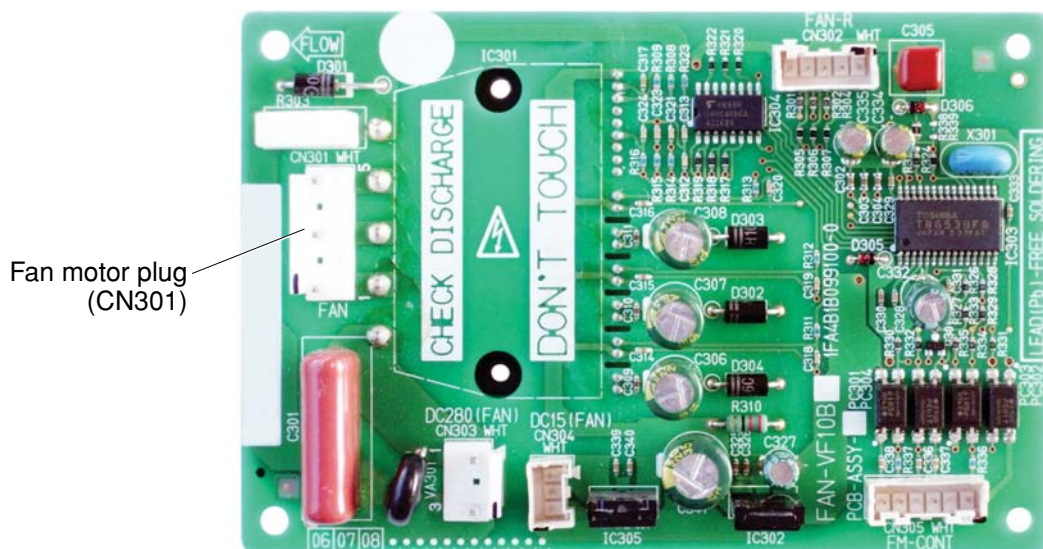
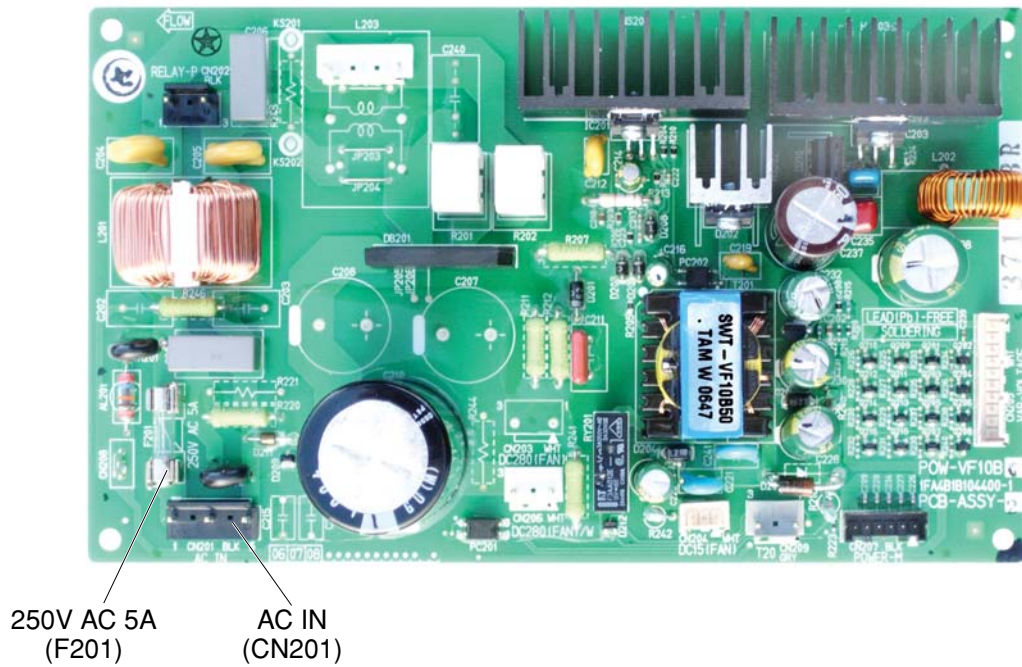
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2. Power PCB (POW-VF10BG) .....	5-3
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# 1. Explanation of Functions

## 1. Control PCB (CR-VF10B)



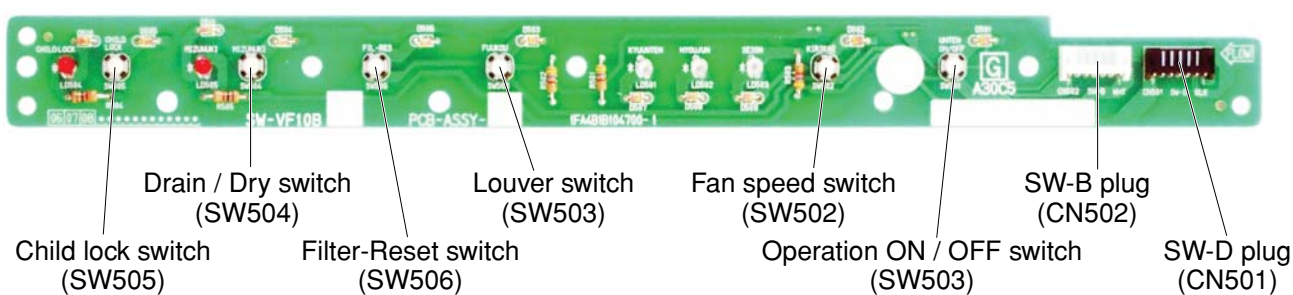




#### 4. Display Section PCB (IND-VF10B)



#### 5. Control Section PCB (SW-VF10B)



#### 6. Electrolysis Condition Setting PCB (SUB-VF10B)



Electrolysis Condition Setting switch (SW601)

#### NOTE

- At time of shipment: Knob set to "5."
- When setting the electrolysis condition, refer to "Electrolysis setting condition and the number of water filters."

## 2. Clearing the Total Times (Filter, Water Change, Electrolyzing Unit Change)

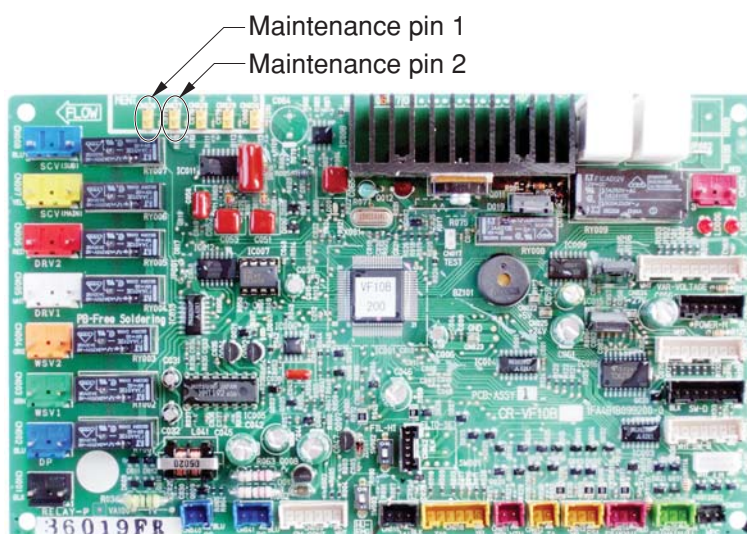
Follow the procedure below to clear (reset) the total times for filter cleaning, water change, and electrolyzing unit change after servicing and maintenance are completed.

### 1. Clearing the total times for filter and water change

Step 1	Short-circuit maintenance pin 1 on the control PCB.
Step 2	Press the FILTER RESET button. The buzzer sounds once and the total times are cleared.

### 2. Clearing the total time for electrolyzing unit change

Step 1	Short-circuit maintenance pin 2 on the control PCB.
Step 2	Press the FILTER RESET button. The buzzer sounds once and the total times are cleared.



### 3. Turning the Buzzer ON/OFF

The system contains a buzzer that sounds to inform the user when water must be added. This buzzer can be turned ON/OFF by means of setting item code “83” on the control PCB EEPROM.

Setting data

00: Buzzer ON (setting at time of shipping from the factory)

01: Buzzer OFF

Use the maintenance remote control unit (described below) to turn the buzzer ON/OFF.

(1) RCS-TM80BG (85978487)

(2) Wire K (8540528057900)

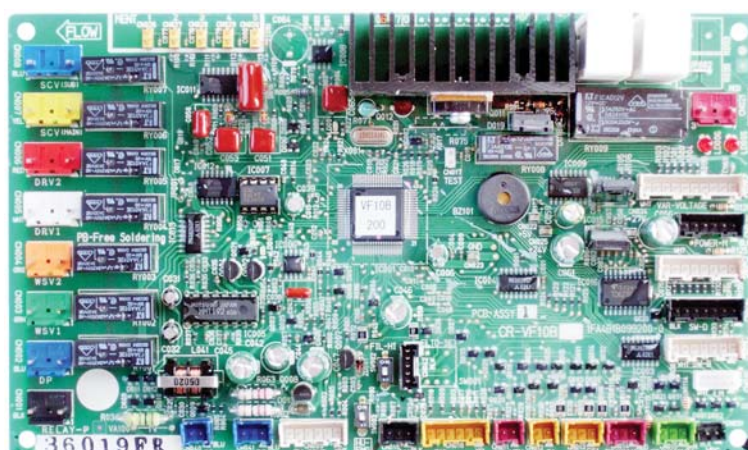
This operation must be performed when the system is stopped.

<Preparation for change>

Connect the maintenance remote control unit to the RC plug on the PCB.







Note: Connect the 3P of wire K to the RC plug on the Control PCB and connect the 2P of the wire K to the remote control unit. If another wire has already been plugged into the remote control unit, replace with wire K.

(Regarding how to open the lid of the remote control unit, refer to the Instruction Manual supplied with the remote control unit.)

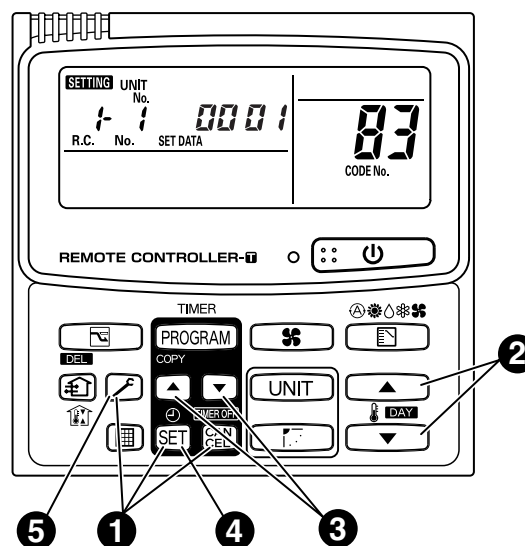


5

<Procedure>

- ① Press and hold the  button, **SET** button and **CAN CEL** button simultaneously for 4 seconds or longer.
- ② Use the Temperature Setting  /  buttons to select item code “83.”
- ③ Use the timer time  /  buttons to change the setting data.
- ④ To confirm the changed setting data, press the **SET** button. (At this time, “Now Setting” stops blinking and remains lit.)
- ⑤ To exit the setting mode, press the  button.

Maintenance Remote Control Unit



## 4. Changing the Cleaning Monitor Display

The cleaning monitor display can be changed by means of setting item code "88" on the control PCB EEPROM.

Setting data

00: Standard display (setting at time of shipment from the factory)

01: Humidity indicator

02: Blinking line display when cleaning indicator is full

03: Blinking line display when humidity indicator and cleaning indicator are full

Use the maintenance remote control unit to change the cleaning monitor display.

(1) RCS-TM80BG (85978487)

(2) Wire K (8540528057900)

This operation must be performed when the system is stopped.

For the <Preparation for change> and <Procedure>, refer to "3. Turning the Buzzer ON/OFF."

<Cleaning monitor display>

(1) Setting data 00: Standard display (setting at time of shipment from the factory)

Unit status	Total airflow	TREATED AIR VOLUME
Stopped		
Operating	0 – Less than 300 m <sup>3</sup>	
	300 – Less than 600 m <sup>3</sup>	
	600 – Less than 900 m <sup>3</sup>	
	900 – Less than 1200 m <sup>3</sup>	
	1200 – Less than 1500 m <sup>3</sup>	
	1500 m <sup>3</sup> or more	

(2) Setting data 01: Humidity indicator (Displayed when the FILTER RESET SW is pressed.)

Unit status	Humidity	TREATED AIR VOLUME
Stopped		
Operating	29 % or less	(Blinking)
	30 – 39 %	
	40 – 49 %	
	50 – 59 %	
	60 – 69 %	
	70 – 79 %	
	80 % or more	(Blinking)

(3) Setting data 02: Blinking line display when cleaning indicator is full

Unit status	1 → 6 → 1 (Repeats)	TREATED AIR VOLUME
Operating	1	
	2	
	3	
	4	
	5	
	6	

(4) Setting data 03: Blinking line display when humidity indicator and cleaning indicator are full.

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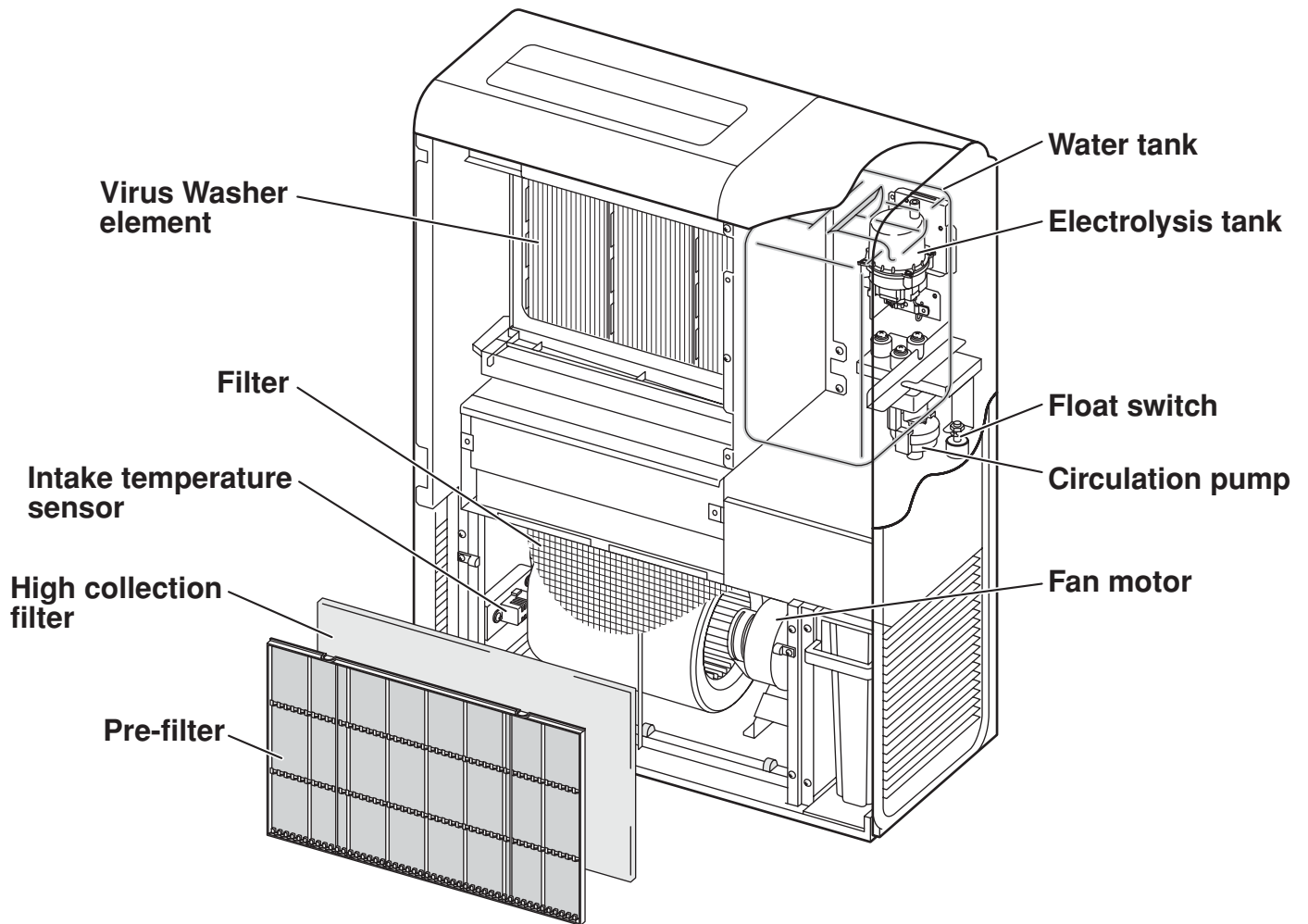
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Before beginning work, stop the system and be sure to unplug the power cord from the outlet.

## 1. Diagram of Functional Parts





## 2. Maintenance Procedure

### 1. Replacing the Virus Washer element

The Virus Washer element must be periodically replaced. It is possible for the customer to replace the element, however a regular maintenance contract is recommended.

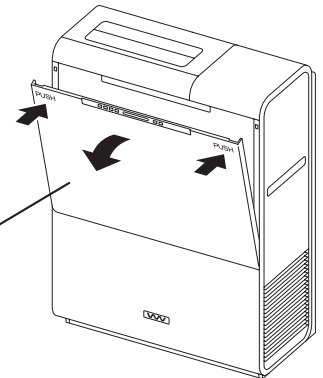
The Virus Washer element must be replaced (at charge to the customer) once a year. Contact the dealer where the system was purchased.

**① Stop the system and unplug the power cord.**

**Then disconnect the front upper panel.**

Press at the points marked "PUSH" at the top left and right of the front upper panel, then pull the top of the panel toward you to remove it.

Front upper panel



**② Use a Phillips-head screwdriver to remove the 4 screws, then remove the housing (styrofoam).**



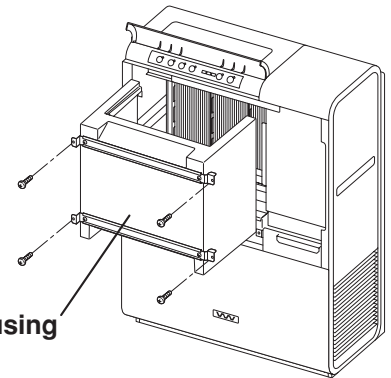
#### CAUTION

- Verify that the system is stopped and the power cord has been unplugged.

**③ Remove the outlet filter case.**

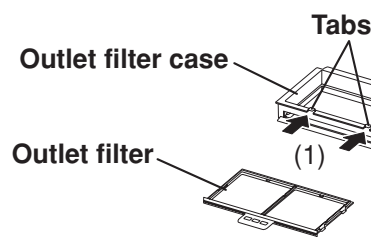
- (1) Press inward and disengage the front tabs.
- (2) Pull downward.

Housing



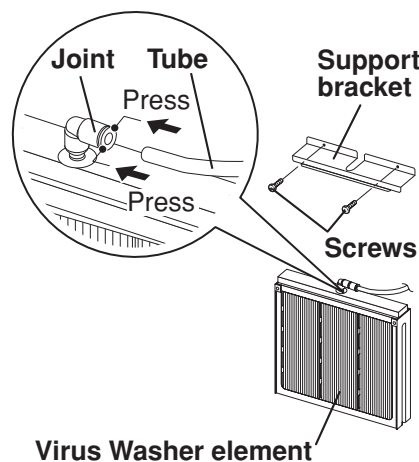
**④ Remove the support bracket.**

Remove the 2 screws.



**⑤ Disconnect the tube from the joint.**

Press evenly at the locations indicated by the arrows to disengage the lock. Then pull out the tube while continuing to press. If only one side is pressed, it will not be possible to disconnect the tube.



**⑥ Remove and replace the element.**

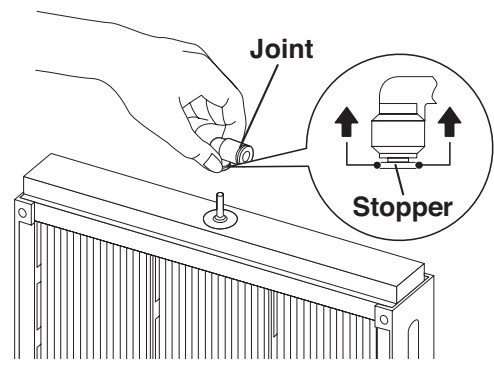
Wipe away any dirt or scale that has accumulated in the electrolysis tray grooves.

Virus Washer element

- ⑦ **Disconnect the joint from the Virus Washer element.**  
Press on the stopper at the base of the joint while pulling the joint upward to remove it.  
Securely attach the removed joint to the new Virus Washer element.

**CAUTION**

- If the joint is not securely attached, water leakage will occur.

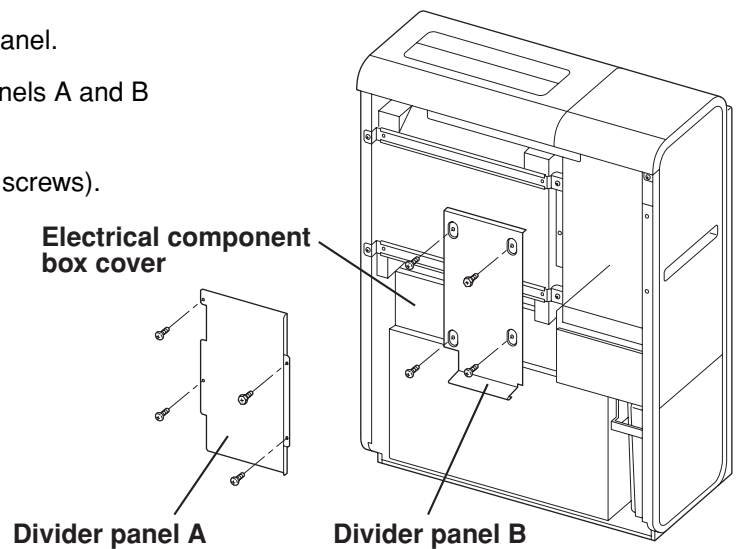


- ⑧ **Install the Virus Washer element.**  
Follow the procedure for removal in the reverse order.  
When attaching the tube to the joint, insert the tube all the way until the end of the tube makes contact.  
Pull on the tube and verify that it does not disconnect.

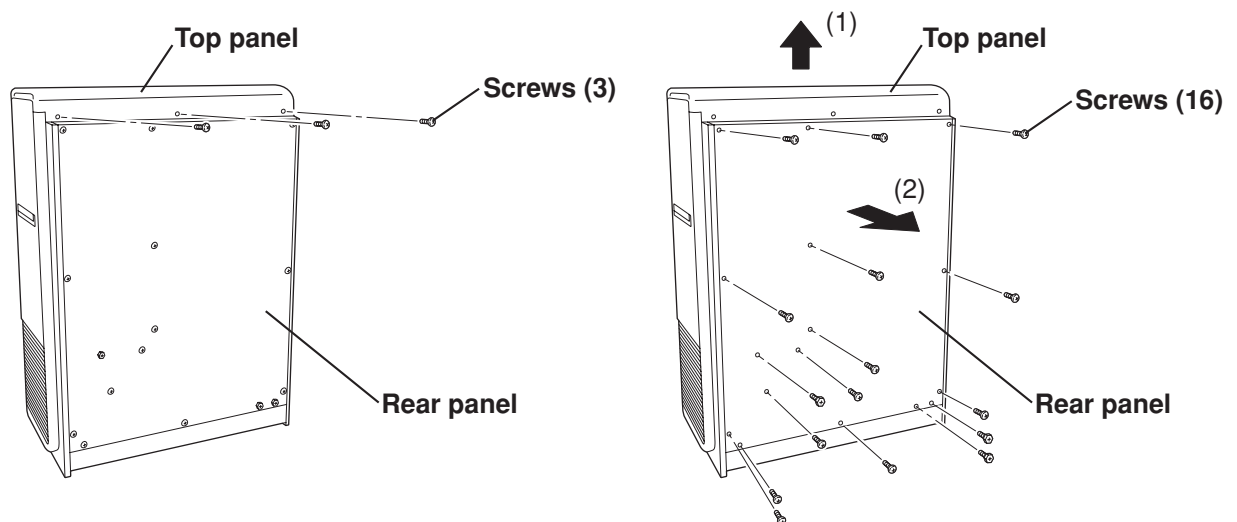


## 2. Replacing the electrolysis tank

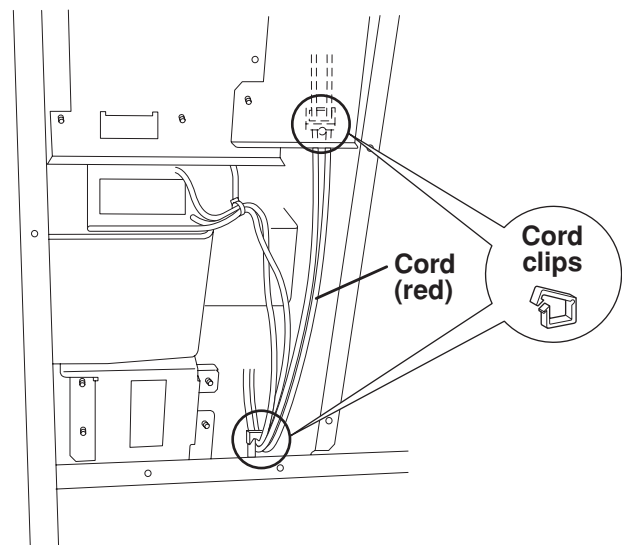
- ① Stop the system and unplug the power cord.
- ② Remove the top and bottom parts of the front panel.
- ③ Remove the water tank, and remove divider panels A and B (4 screws each).
- ④ Remove the electrical component box cover (4 screws).



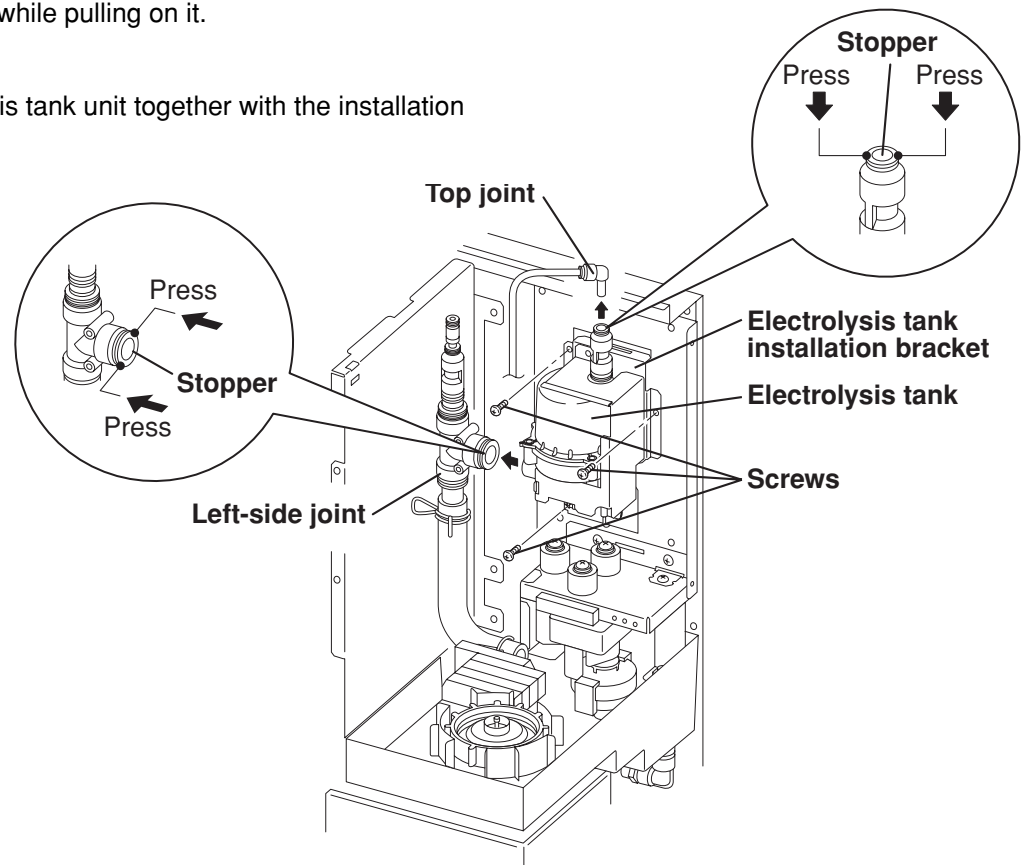
- ⑤ Remove the 3 screws that fasten the top panel, and the 16 screws that fasten the rear panel. Then lift up the top panel (1) and pull the rear panel back in order to remove it (2).



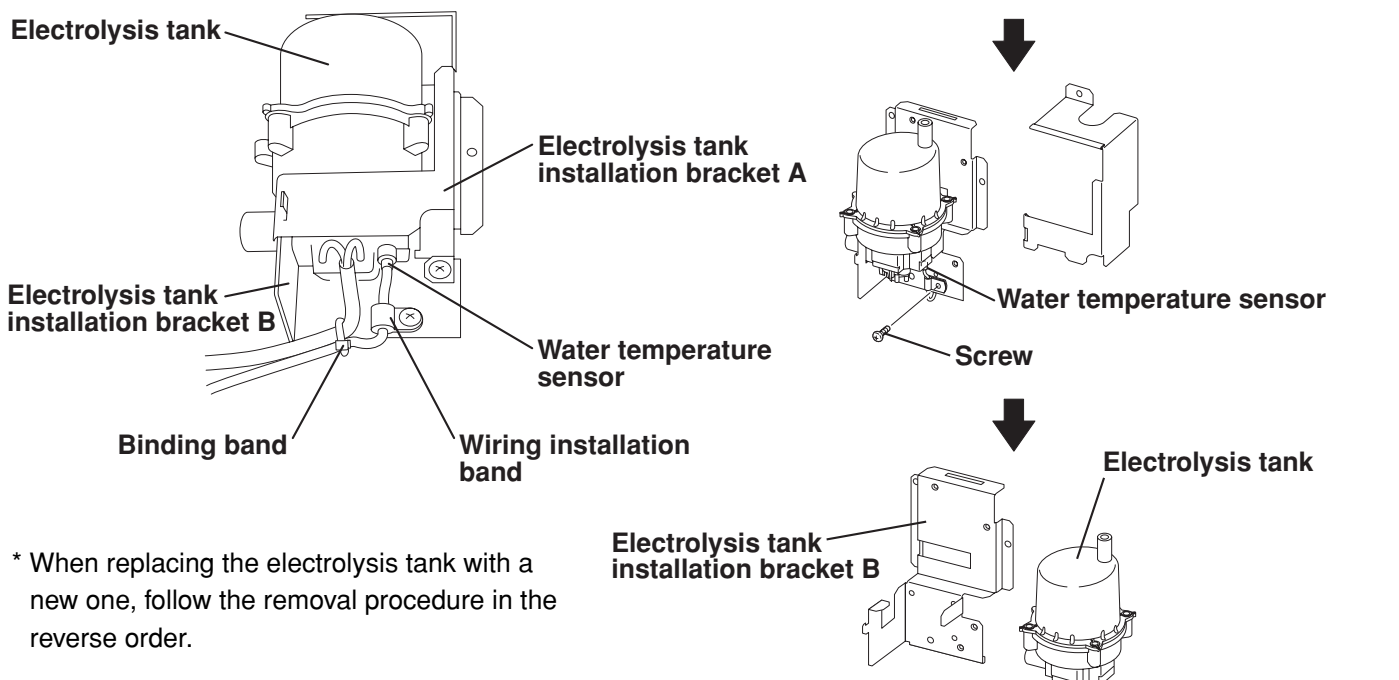
- ⑥ Disconnect the electrolysis tank cord (red) from the cord clips (2 locations).



- ⑦ Remove the top joint and left-side joint from the electrolysis tank unit. To remove the joint, press the stopper at the base of each joint while pulling on it.
- ⑧ Remove the electrolysis tank unit together with the installation bracket (3 screws).



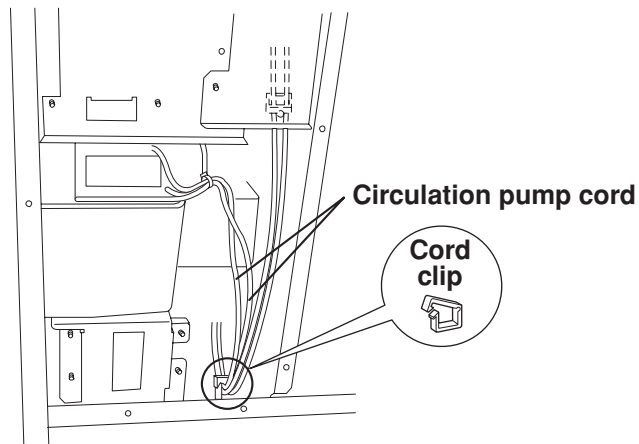
- ⑨ Remove the screws (2) from electrolysis tank installation bracket A, then disconnect it from electrolysis tank installation bracket B. Remove the screw (1) that fastens the wiring installation band, then pull out the water temperature sensor. Cut the wire binding band, and remove the electrolysis unit from electrolysis tank installation bracket B.



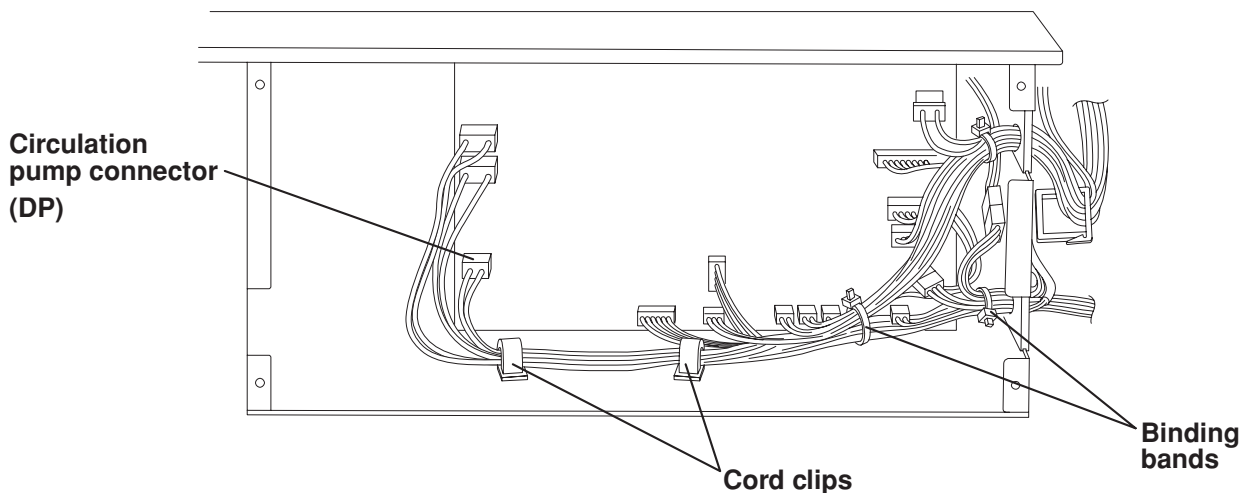
\* When replacing the electrolysis tank with a new one, follow the removal procedure in the reverse order.

### 3. Replacing the circulation pump

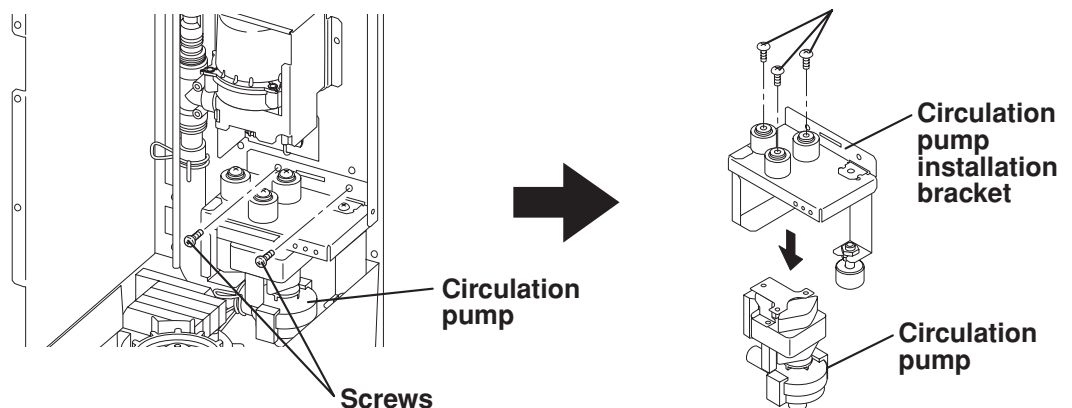
- ① Perform steps ① – ⑤ from “Replacing the electrolysis tank.”
- ② Disconnect the circulation pump cord from the cord clip.



- ③ Cut the binding bands (2) inside the electrical component box, then open the cord clips (2) and disconnect the circulation pump connector.

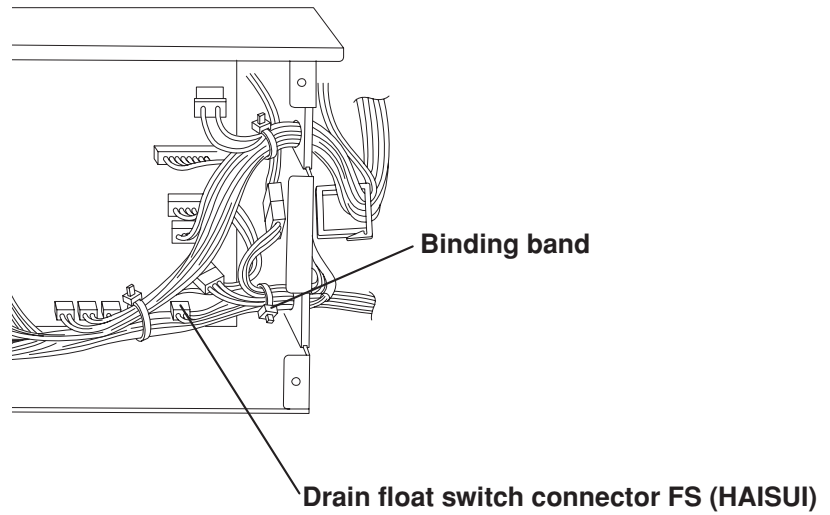


- ④ Remove the installation screws (2) from the circulation pump installation bracket, then remove the circulation pump together with the bracket.
- ⑤ Remove the screws (3) from the circulation pump installation bracket, then remove the circulation pump.

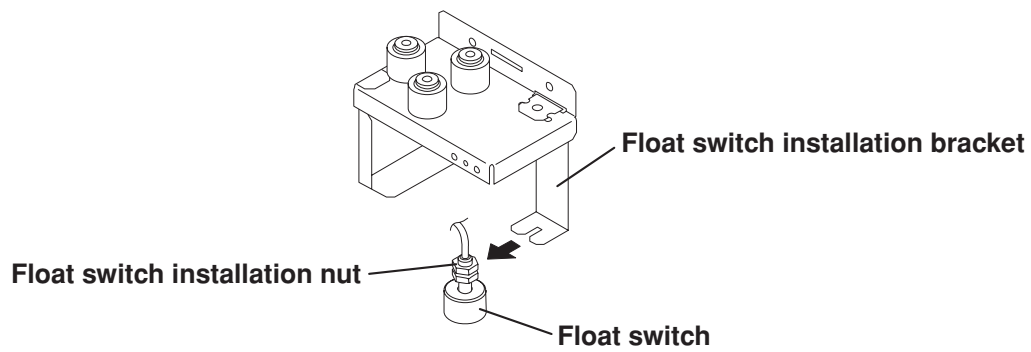


#### 4. Replacing the float

- ① Perform steps ① – ② from “Replacing the circulation pump.”
- ② Disconnect the drain float switch connector.

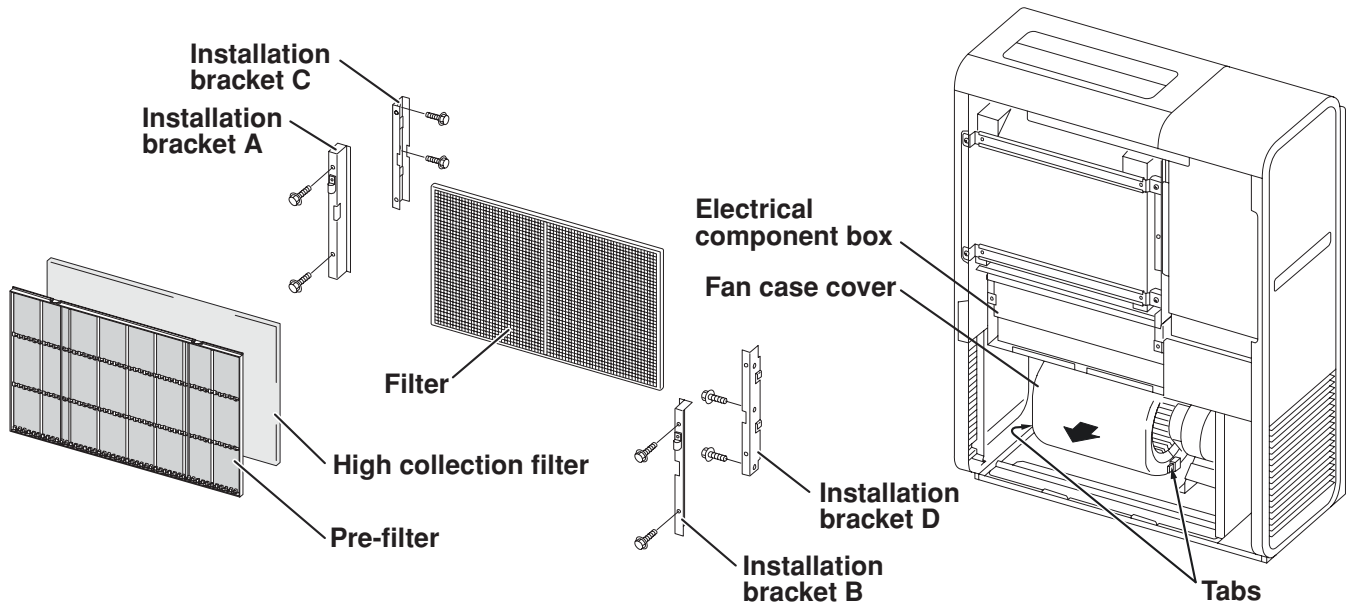


- ③ Loosen the float switch installation nut on the float switch installation bracket, then remove the float switch.

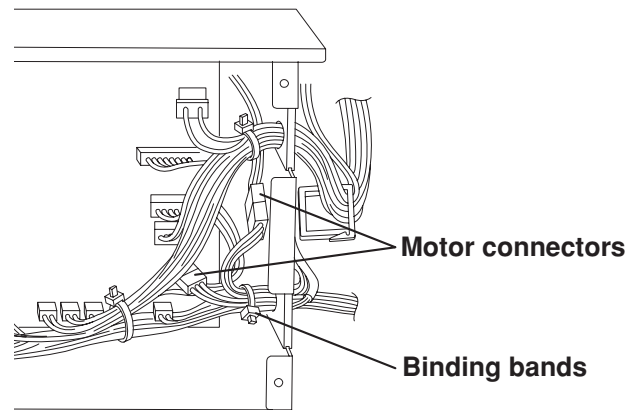


## 5. Replacing the fan motor

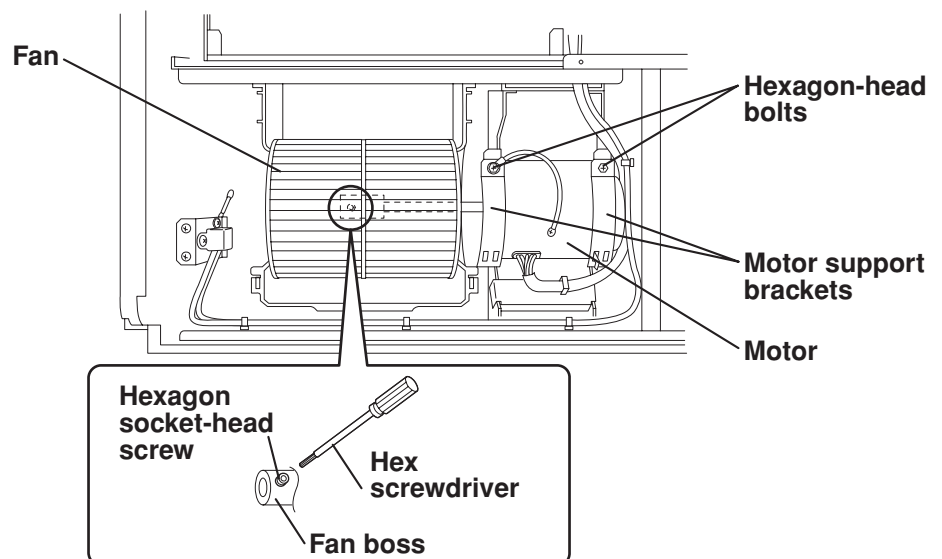
- ① Stop the system and unplug the power cord.
- ② Remove the top and bottom parts of the front panel, and remove the cover from the electrical component box (4 screws).
- ③ Remove the pre-filter and high collection filter. Remove installation brackets A, B, C, and D (8 screws), and remove the filters from them.
- ④ Press the tabs (2) on the left and right of the fan case cover toward the inside to disengage them.



- ⑤ Cut the binding bands inside the electrical component box, then disconnect the motor connectors (2).

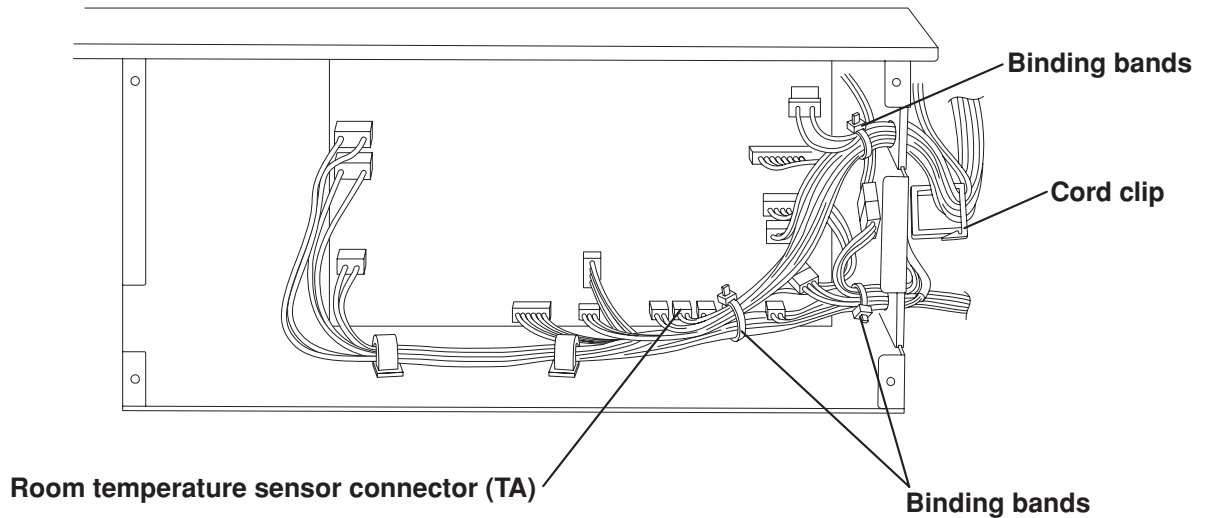


- ⑥ Insert a hex screwdriver through the fan notch and loosen the hexagon socket-head screws that fasten the fan. Next remove the hexagon-head bolts (2) and remove the motor support brackets. Then pull the motor to the right and disengage it from the fan boss before pulling it out toward you.

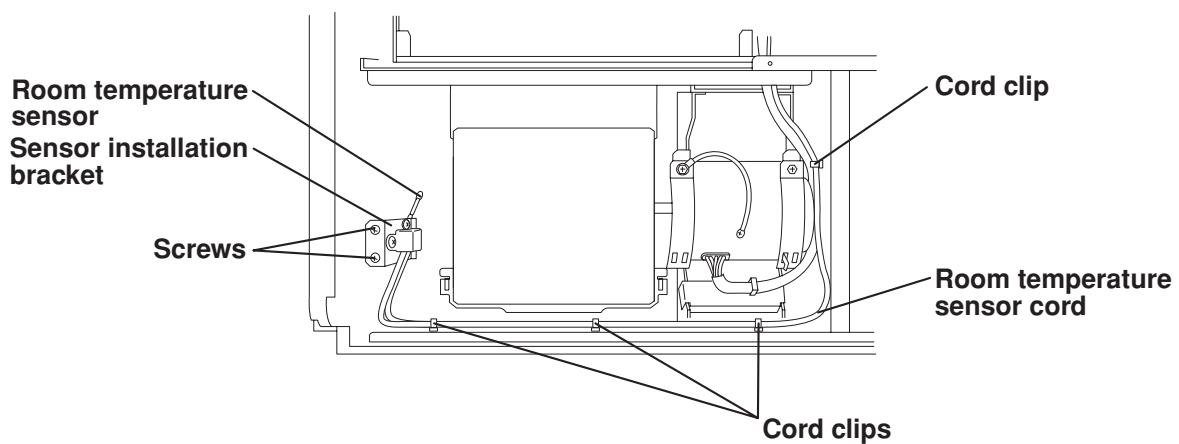


## 6. Replacing the room temperature sensor

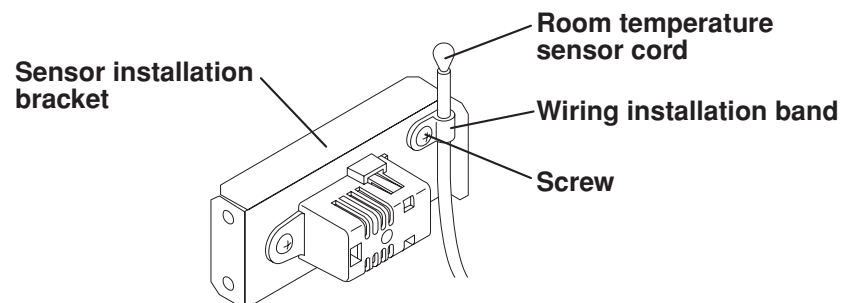
- ① Perform steps ① – ③ from “Replacing the fan motor.”
- ② Disconnect the room temperature sensor cord from the cord clip, then cut the binding bands (2) inside the electrical component box, and disconnect the room temperature sensor connector.



- ③ Remove the sensor installation bracket (2 screws).  
Disconnect the room temperature sensor cord from the cord clips (4 locations).

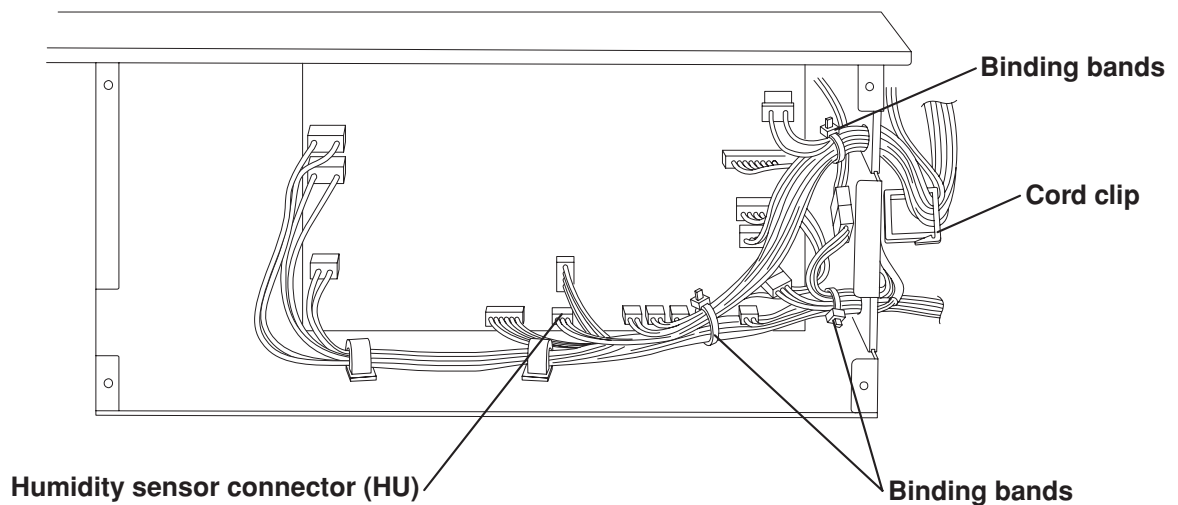


- ④ Remove the screw (1) from the wiring installation band, and remove the room temperature sensor.

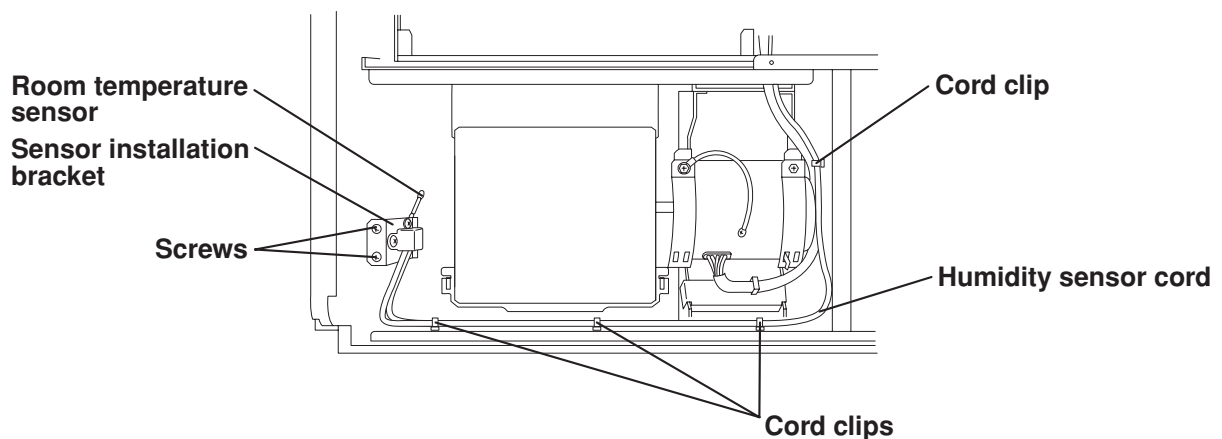


## 7. Replacing the humidity sensor

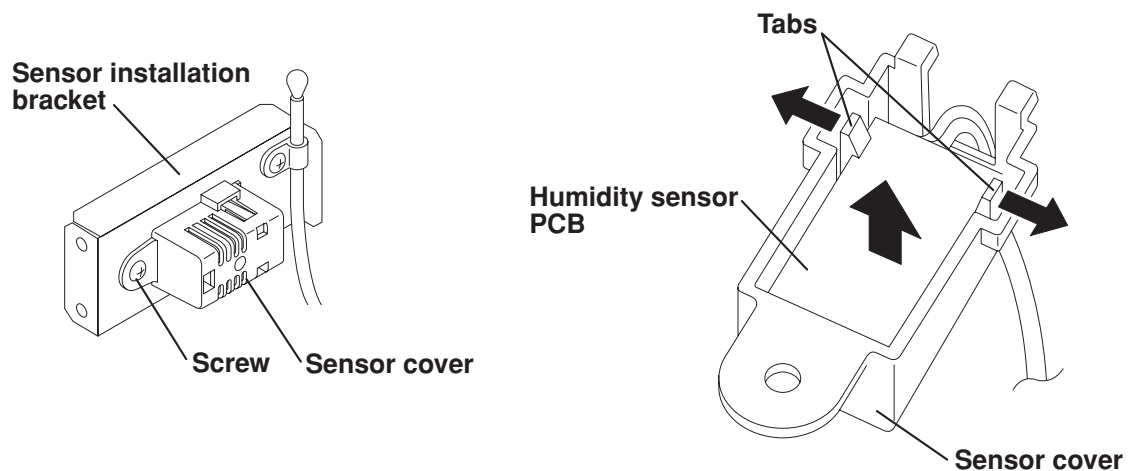
- ① Perform steps ① – ③ from “Replacing the fan motor.”
- ② Disconnect the humidity sensor cord from the cord clip, then cut the binding bands (2) inside the electrical component box, and disconnect the humidity sensor connector.



- ③ Remove the sensor installation bracket (2 screws).  
Disconnect the humidity sensor cord from the cord clips (4 locations).



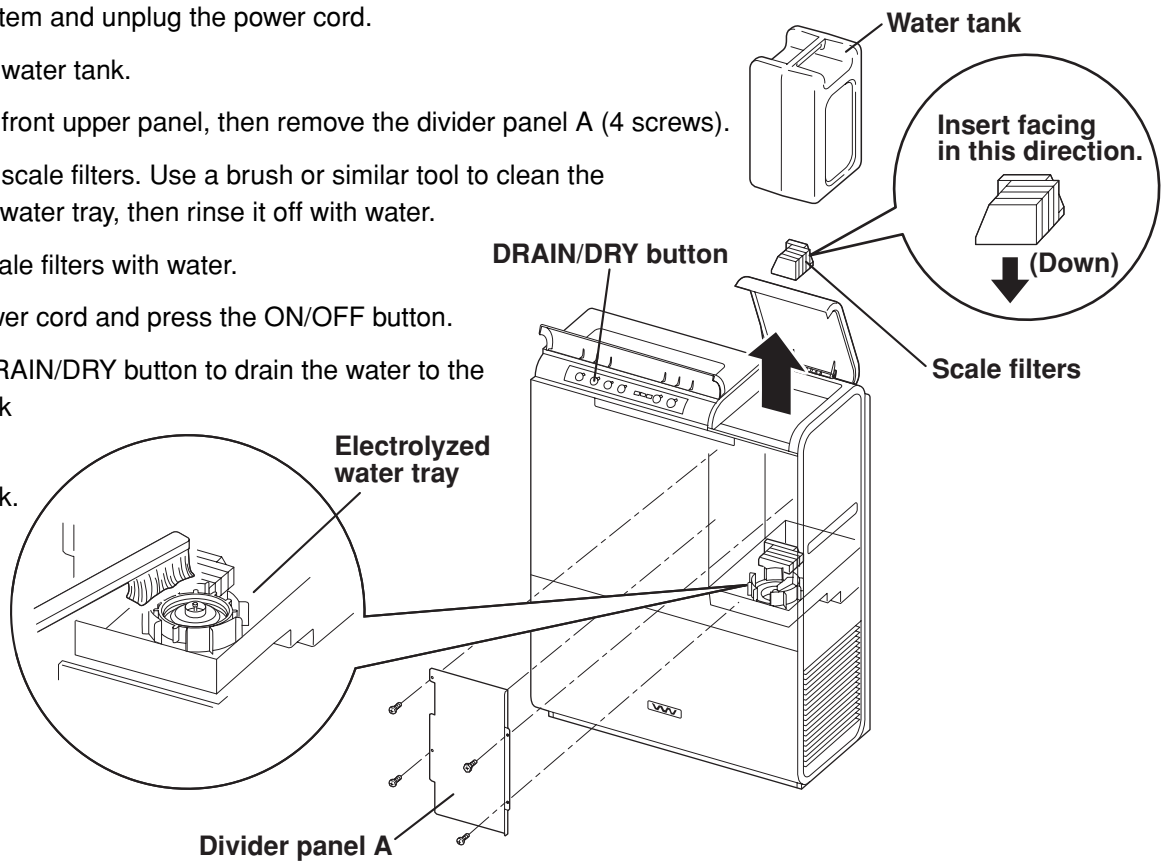
- ④ Remove the screw (1) from the sensor cover, then remove the sensor cover from the sensor installation bracket.  
Next, open the sensor cover tabs (2) and remove the humidity sensor PCB.





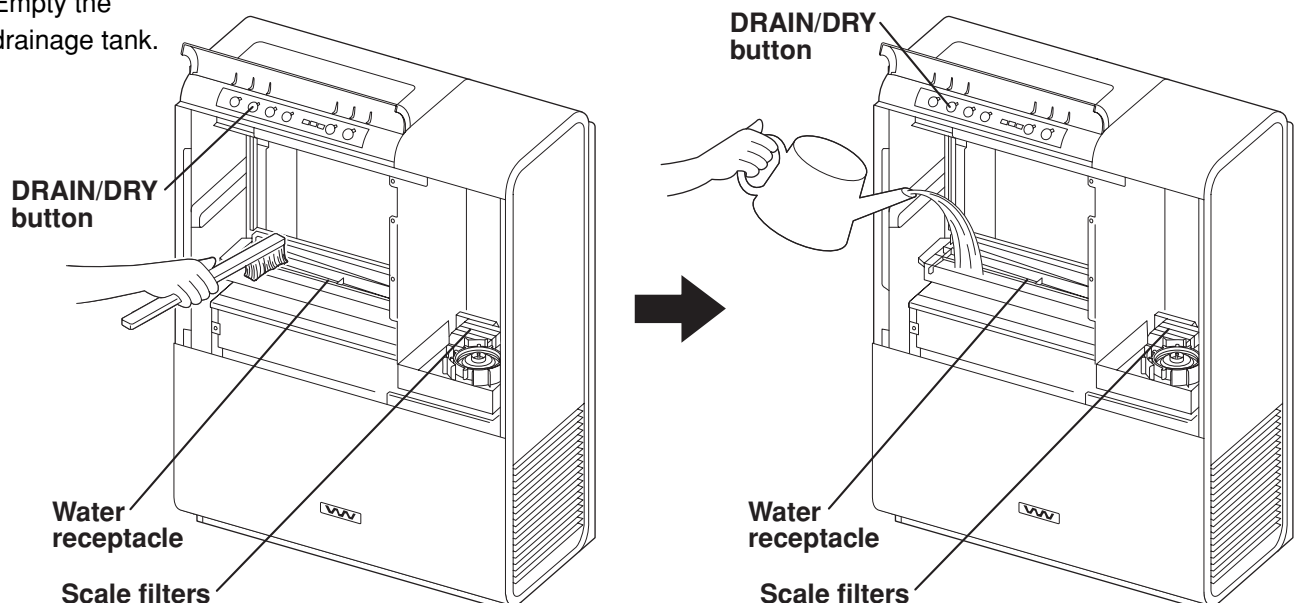
## 8. Cleaning the electrolyzed water tray

- ① Stop the system and unplug the power cord.
- ② Remove the water tank.
- ③ Remove the front upper panel, then remove the divider panel A (4 screws).
- ④ Remove the scale filters. Use a brush or similar tool to clean the electrolyzed water tray, then rinse it off with water.
- ⑤ Rinse the scale filters with water.
- ⑥ Plug the power cord and press the ON/OFF button.
- ⑦ Press the DRAIN/DRY button to drain the water to the drainage tank
- ⑧ Empty the drainage tank.



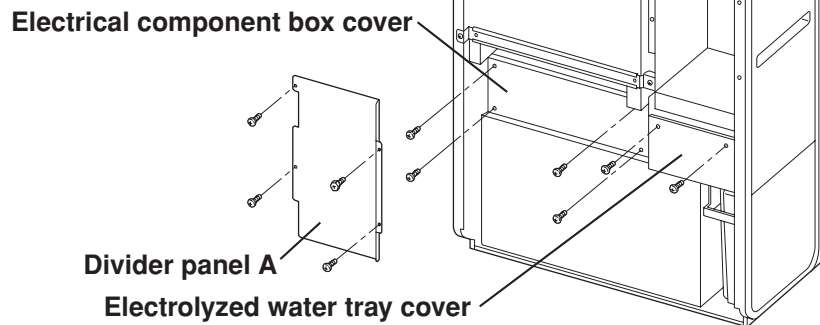
## 9. Cleaning the water receptacle

- ① Stop the system and unplug the power cord.
- ② Remove the water tank, then remove the scale filters.
- ③ Perform steps ① – ⑥ from “Replacing the Virus Washer element.” Then remove the Virus Washer element.
- ④ Use a brush or similar tool to clean the water receptacle and remove scale, then rinse with water. Press the DRAIN/DRY button to drain the water to the drainage tank.
- ⑤ Plug the power cord and press the ON/OFF button.
- ⑥ Press the DRAIN/DRY button to drain the water to the drainage tank.
- ⑦ Empty the drainage tank.

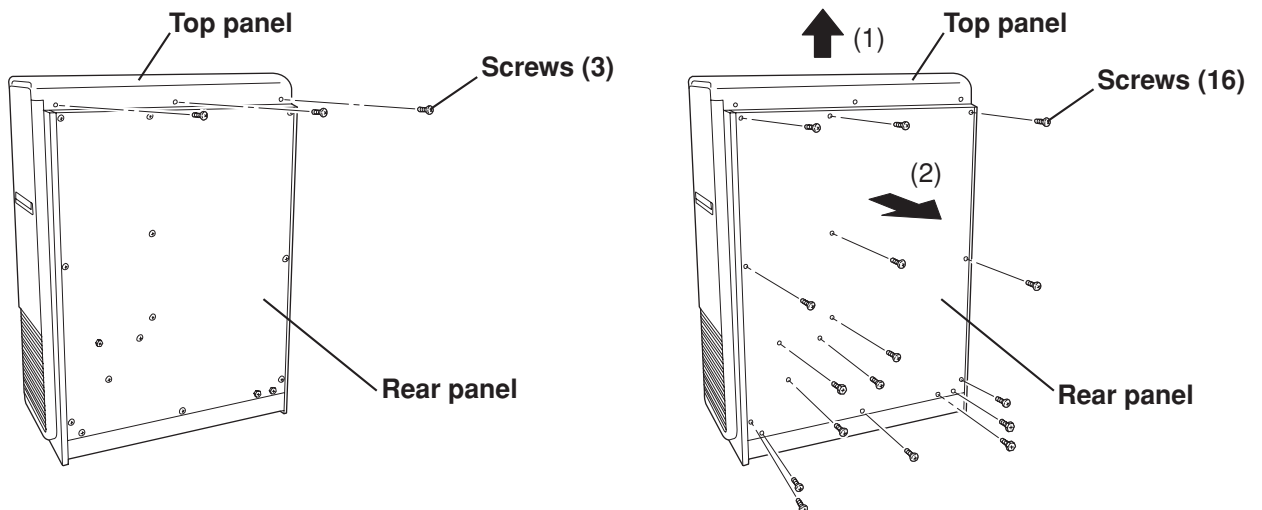


## 10. Replacing the solenoid valves

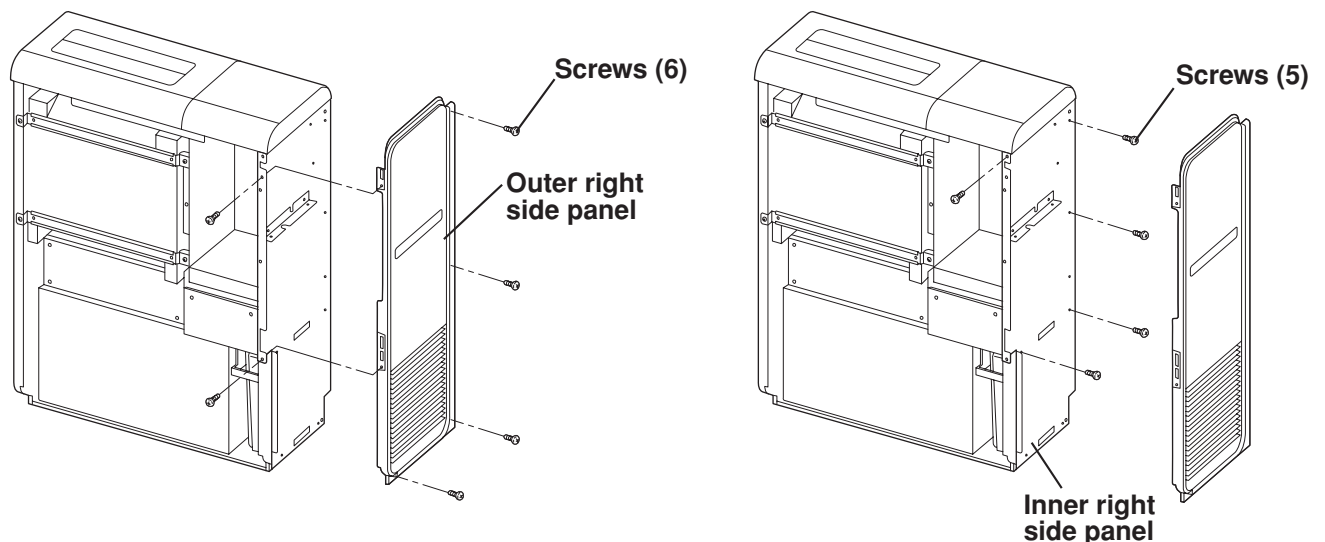
- ① Stop the system and unplug the power cord.
- ② Remove the top and bottom parts of the front panel.
- ③ Remove the water tank. Remove the divider panel A (4 screws), then remove the electrolyzed water tray cover (2 screws) and remove the electrical component box cover (4 screws).



- ④ Remove the 3 screws that fasten the top panel and the 16 screws that fasten the rear panel. Then lift up the top panel (1) and pull the rear panel back in order to remove it (2).

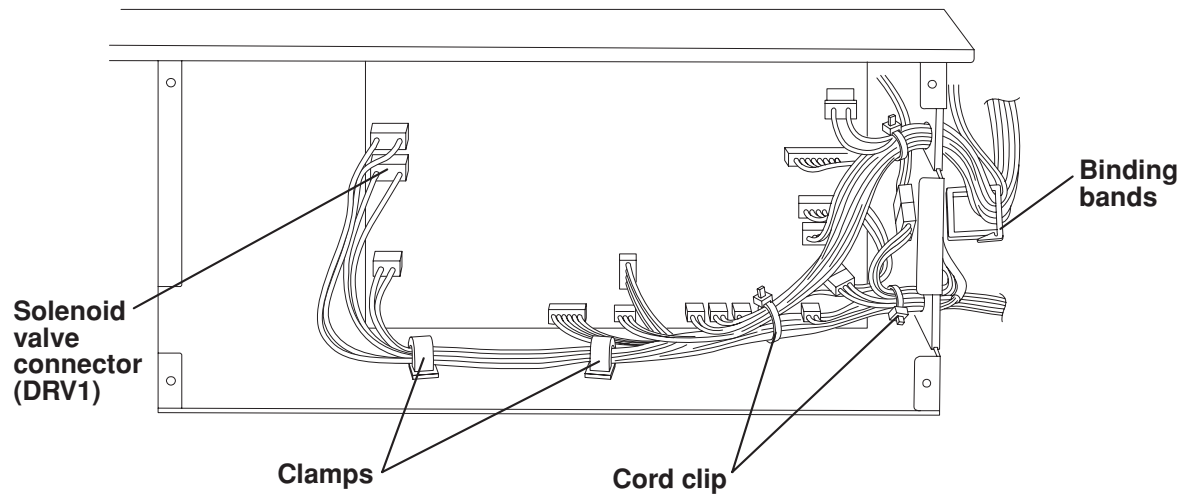


- ⑤ Remove the outer right side panel (6 screws), then remove the inner right side panel (5 screws).

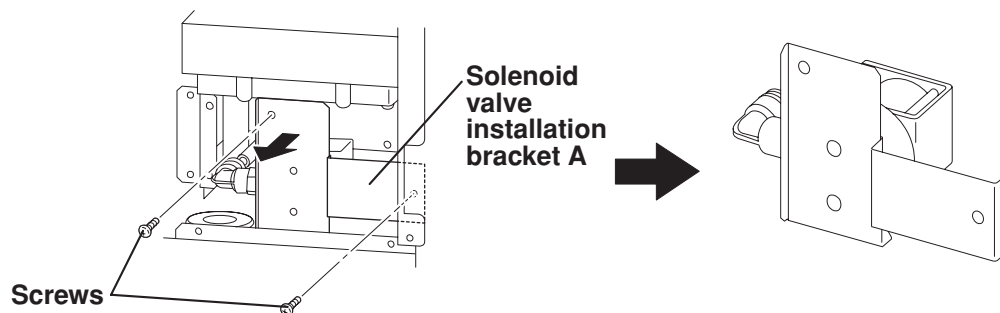


**⑥** Replace the solenoid valve.

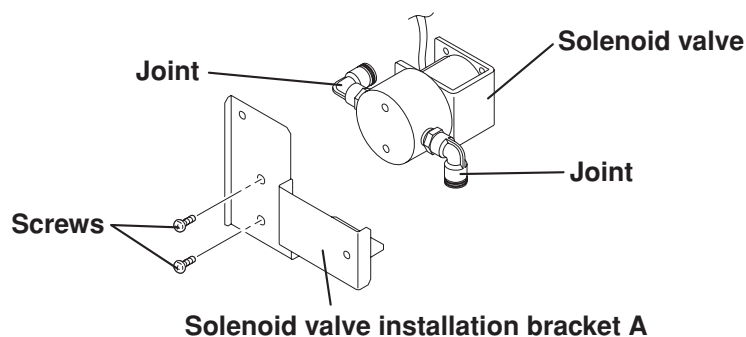
- (1) Cut the binding bands (2) inside the electrical component box, then disconnect the solenoid valve connector and remove the cord from the clamps (2).



- (2) Remove the solenoid valve installation bracket A (2 screws), then disconnect the transparent tube from the left joint. Lift up the solenoid valve unit while pulling it out toward the front. (For the method used to disconnect the transparent tube from the joint, refer to step ⑤ from “Replacing the Virus Washer element.”)

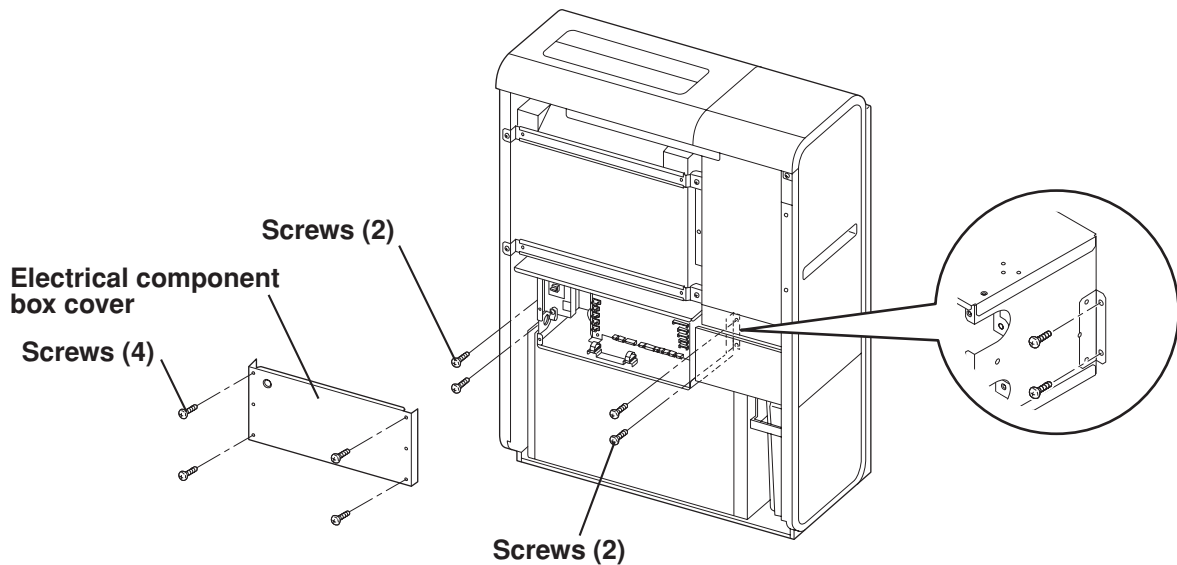


- (3) Remove the solenoid valve from the installation bracket A (2 screws).

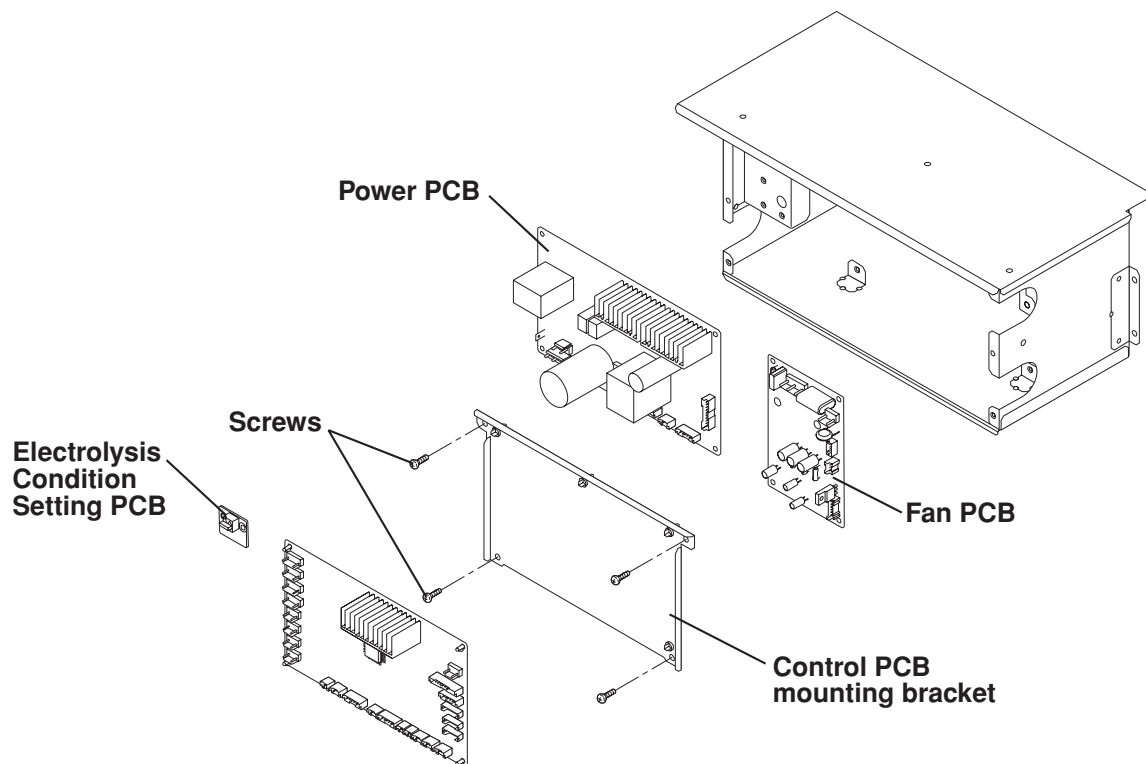


## 11. Replacing the PCBs inside the electrical component box

- ① Stop the system and unplug the power cord.
- ② Remove the top and bottom parts of the front panel.
- ③ Remove the electrical component box cover (4 screws). Disconnect all cords that run into the electrical component box. Next, remove the screws (2 each on the left and right sides) that fasten the electrical component box and remove the electrical component box.



- ④ The PCBs are arranged as shown in the figure below. When removing the power PCB or fan PCB, first remove the control PCB mounting bracket (4 screws) then remove the power PCB or fan PCB.



CONTENTS



7. INSTALLATION

1. Accessories ..... 7-2

2. Installation Location ..... 7-3

3. Installation Procedure ..... 7-4

**Installation****For the Person in Charge of Installation****VW-VF10BG****1. Accessories**

Part Name	Figure	Q'ty	Remarks
Chain		2	For preventing unit tip-over
Measuring spoon		2	For measuring salt (1 g)

**Safety Precautions**

- Read the "Safety Precautions" carefully before performing installation or electrical work, and perform the work correctly.
- The precautions listed here are divided into WARNING and CAUTION categories. Both contain important information related to safety. Be sure to observe them. The meaning of these indications is as explained below.

**WARNING**

Incorrect handling or use may result in death or serious injury to the user.

**CAUTION**

Incorrect handling or use may result in injury to the user, or in property damage.

- After installation is completed, perform a test run and verify that there is no trouble. Also explain to the customer how to use, clean, and maintain the product, as described in the Instruction Manual. Request that the customer store this document ("For the Person in Charge of Installation") together with the Instruction Manual.
- The supplied two measuring spoons are provided for use in certain regions. Store them in a safe place. For details, refer to the Instruction Manual.

**WARNING**

- Request installation and electrical work from the dealer or from a professional agent. Attempting installation yourself, and doing so incorrectly, may result in water leakage, electric shock, fire, or other accident.
- Perform installation work correctly, in accordance with this document ("For the Person in Charge of Installation.") Incorrect installation may result in water leakage, electric shock, fire, or other accident.
- A dedicated circuit is not required for electrical work, however supply power from a wall outlet that includes a leakage breaker. (1ø AC 220 – 240 V)  
Do not use extension cords or plug multiple electrical plugs into the same outlet. If the power cord does not reach the outlet, change the installation location or add an additional outlet at a position that the power cord will reach. Be sure to connect the ground wire. Insufficient power circuit capacity or incorrect electrical work may result in electric shock or fire.
- Insert the power plug securely, all the way to the base. Do not use a plug that is not fully inserted, or that is damaged. Do not use a loose power outlet. Doing so may result in electric shock or in fire caused by heating.
- Do not install outdoors, or in any location where rainwater may contact the system. Doing so may result in electric shock or fire.

**CAUTION**

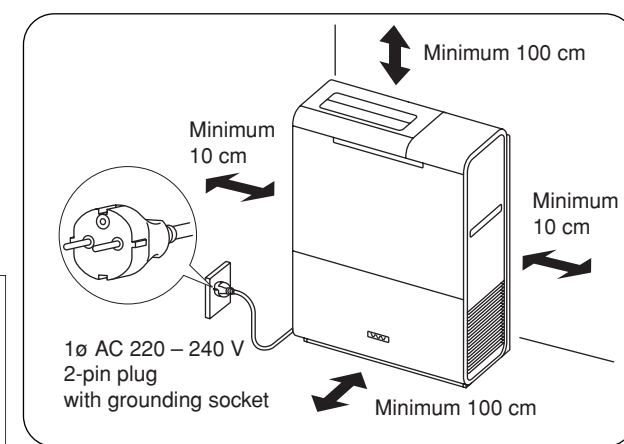
- Rinse out the water tank every day and keep it clean. Then be sure to refill it with tap water. If you continue to use the tank without cleaning it, dirt and water scale may decrease the performance of the unit, or may cause the growth of mold or bacteria, resulting in odor.
- Do not perform cleaning while the system is operating. Doing so may result in electric shock or injury.
- Be sure to unplug the power cord from the wall outlet before performing cleaning.
- After cleaning, be careful not to operate the system with the intake filter, front panel, outlet filter, or other component removed. Doing so may result in system malfunction.
- When unplugging the power cord, do not grasp the cord. Instead, be sure to grasp the power plug on the end to pull out the plug.
- If the system will not be used for a long period of time, drain out the water and unplug the power cord. Drain the water from the water tank and electrolyzed water tray, and in particular be sure to fully dry the Virus Washer element. If the water is not fully drained from the system, the growth of mold or bacteria may result in odor. For details, refer to the servicing technical materials, or else contact the dealer where the system was purchased.

## 2. Installation Location

1. Install in a location where air circulates easily. Make sure that there are no objects obstructing the flow of air at the intake and outlet.
2. Be sure to ensure the space around the unit as shown in the figure at right. Allow a servicing space of 100 cm or more to the front of the unit.

### CAUTION

3. Use the provided chain in order to prevent the unit from tipping over due to an earthquake or other event. Failure to do so may result in an accident if the unit tips over.
4. Do not install in a location that is unstable or not level. (Install at an inclination of 2° or less between the two sides.) Installation in an unstable or inclined location may result in greater operating noise and the risk of tipping over. If the unit tips over, water will spill out.
5. Be sure to connect the ground wire.

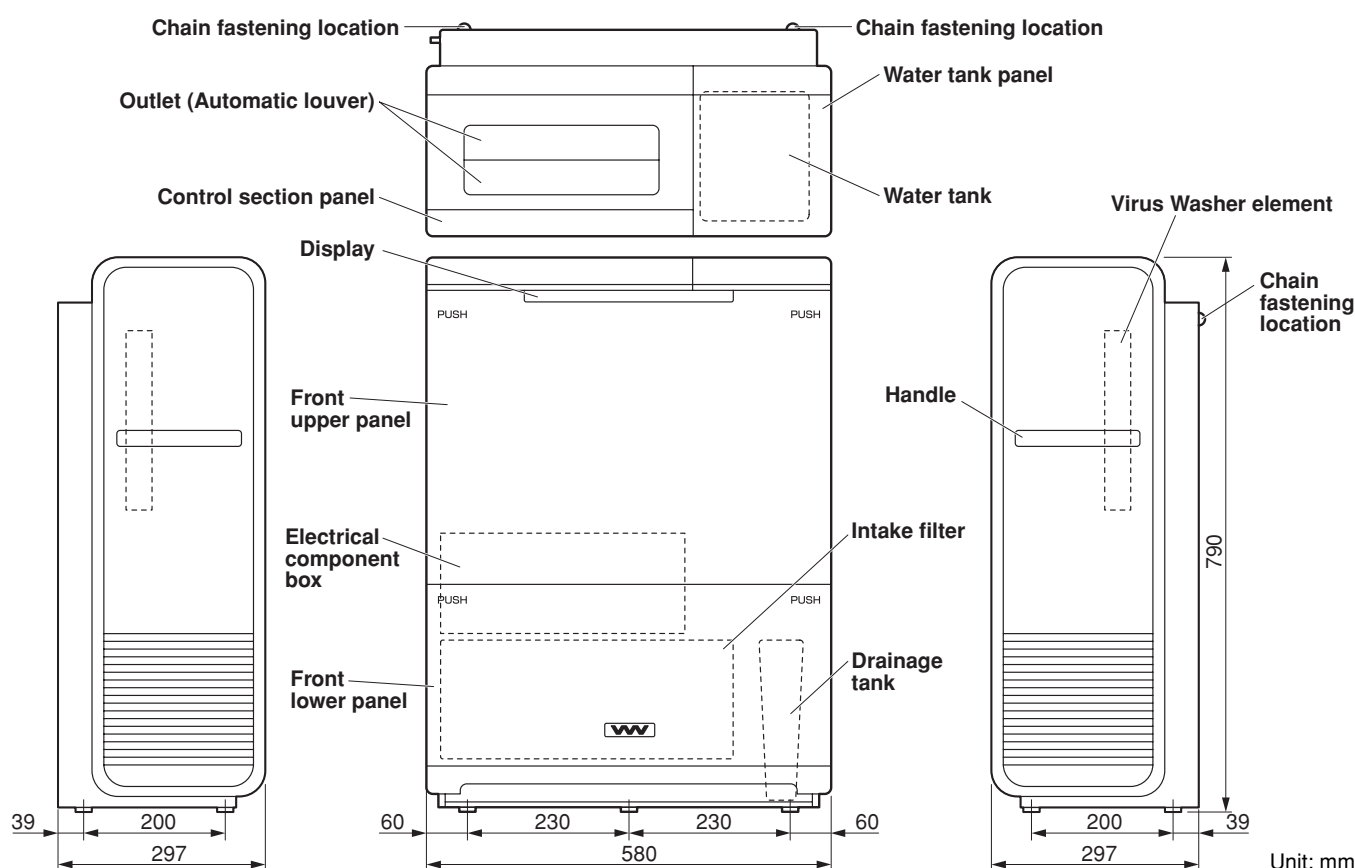


### CAUTION

Avoid installing in locations such as those listed below.

- **Nearby windows and other locations that are susceptible to the effects of outside air, locations where water freezes easily, or locations that receive direct air from an air conditioner or similar device**
- **Locations exposed to direct sunlight or locations near heaters**  
In these locations, the unit may become deformed or discolored. In addition, because the temperature is higher, the water inside the system may become unsanitary.
- **Nearby curtains, or on carpets**  
These objects can obstruct the intake and outlet, and can cause system malfunction. Dust sucked into the intake may also cause system malfunction.
- **High locations, inclined locations, or unstable locations**  
Earthquakes or human contact may cause the unit to fall or tip over. If the unit is installed in an inclined location, the water level sensor may be activated, causing the ADD WATER lamp to turn ON and stopping operation.

## Installation Dimensions and Part Names



Unit: mm



### 3. Installation Procedure

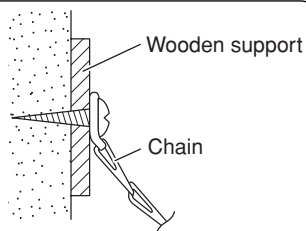
● **Be sure to take the necessary steps to prevent the unit from tipping over.**

Use the provided chain. There is a screw located at the top rear of the unit for this purpose.

- (1) Remove the screw.
- (2) Pass the chain through the screw, then tighten the chain together with the screw in the original screw hole.  
(Refer to the installation dimensions diagram.)
- (3) Use a tapping screw (4 × 25: field supply) to fasten the other end of the chain to the wall.
- (4) The method used to fasten the chain to the wall varies depending on the type of wall material. Use an appropriate method to fasten to the wall. (Refer to the examples below.)

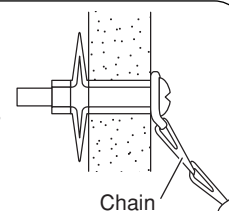
#### Clay wall, plaster wall

Place a wooden support against the wall, and use a screw to fasten the provided chain to the wall.



#### Plasterboard, thin sheet, or hollow wall

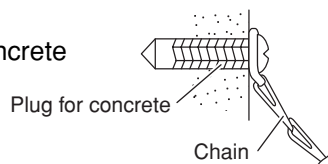
Drive a plug for use in hollow walls into the wall. Then use a screw to fasten the provided chain to the wall.



\* Use a plug that is correct for the thickness of the wall.

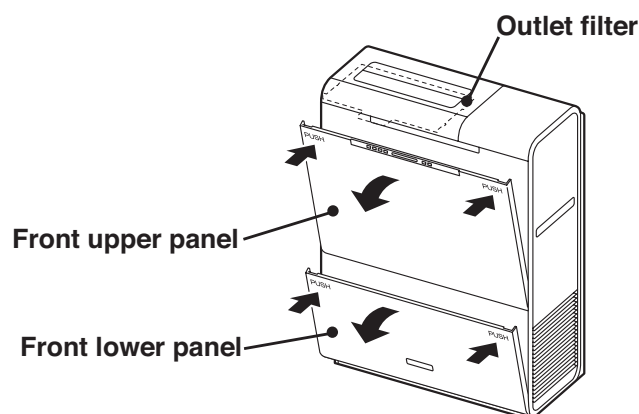
#### Mortar concrete wall

Drive a plug for use in concrete into the wall. Then use a screw to fasten the provided chain to the wall.

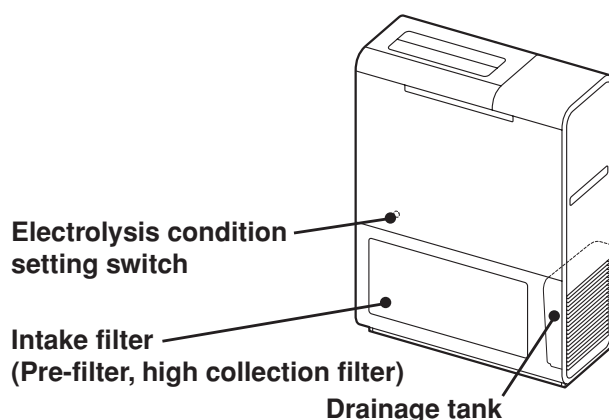


### Precautions Concerning Opening and Closing the Front Panel

- To open the front upper panel, press at the points marked "PUSH" on both sides at the top of the panel. Then tilt the panel and disengage the bottom tabs on both sides of the panel.
- To open the front lower panel, press at the points marked "PUSH" on both sides at the top of the panel. Then tilt the panel and disengage the bottom tabs on both sides of the panel.
- To close the front upper panel or lower panel, follow the same procedure as when opening it, but in the reverse order.



- Remove the front upper panel in order to clean the outlet filter or set the electrolysis condition.
- Remove the front lower panel in order to clean the intake filter or remove the drainage tank.



## Test Run

### ■ Test run

1. Be sure to set the electrolysis condition. (Refer to the Instruction Manual.)
2. Fill the water tank all the way with tap water.

#### ● Be sure to use normal tap (drinking) water.

Never use water from a water purifier, water from a water heater, alkali ion water, mineral water, well water, seawater, or similar types of water.

These types of water cannot be electrolyzed and can cause the growth of mold or bacteria, resulting in odor.

#### ● The electrolysis condition setting must be set correctly according to the water quality in the region where the product is used.

For details, refer to Section 2. USING THIS SYSTEM of the Instruction Manual.

#### ● Verify that the electrolysis condition setting switch is in the correct position.

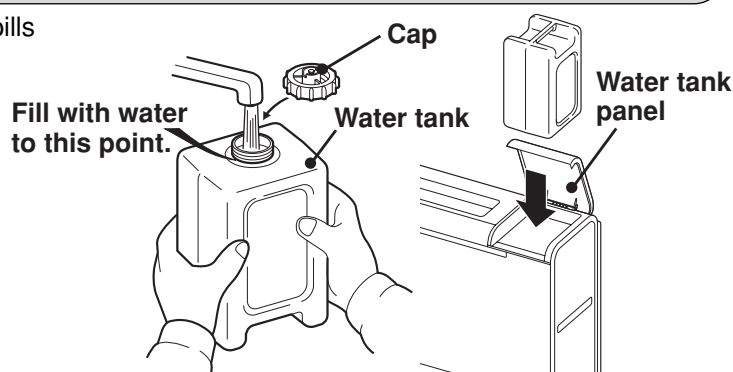
3. Tighten the cap. At this time, check that no water spills from the water tank.

4. Place the water tank in the designated position in the unit.

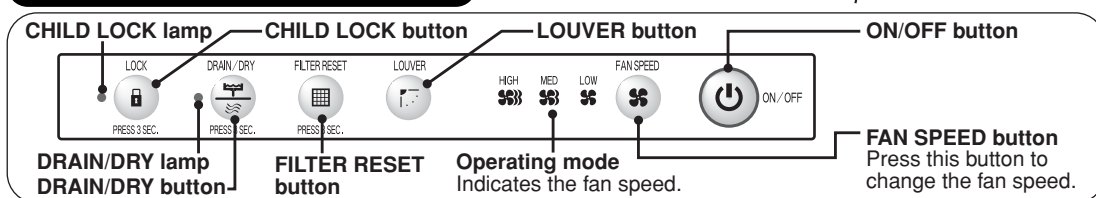
5. Insert the tank gently.

6. Press the control panel ON/OFF button.

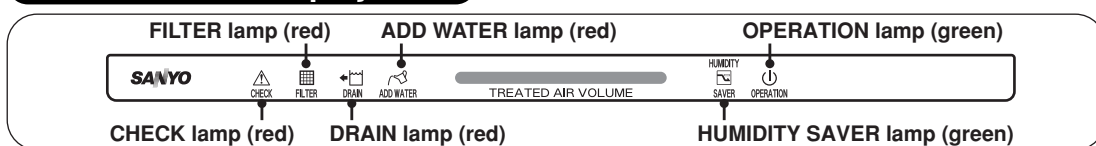
7. Verify that this product begins operating correctly.  
At this time, verify that there is no abnormal noise from the unit, and that there is no vibrating noise.



### Unit built-in control section



### Unit front display



### 8. LED indications

The meaning of the LED indications on the unit front display are as shown below. Take appropriate steps according to the system status.

○: ON    ⊙: Blinking (1 second ON, 1 second OFF)    ⊙2: Blinking (2 seconds ON, 1 second OFF)    ●: OFF

Operation status	Control section						Display	
	CHECK LED	FILTER LED	DRAIN LED	ADD WATER LED	HUMIDITY SAVER LED	OPERATION LED	CHILD LOCK LED	DRAIN / DRY LED
Stopped	●	●	●	●	●	●	●	●
Operating	●	●	●	●	●	○	●	●
Alarm	⊙	●	●	●	●	○	●	●
Filter indicator	●	○	●	●	●	○	●	●
Add water request	●	●	●	○	●	○	●	●
Drain request	●	●	○	●	●	○	●	●
Freeze prevention activated	●	●	●	●	⊙	○	●	●
Warming up	●	●	●	●	●	⊙2	●	●
Drainage control in progress	●	●	●	●	●	●	●	○
Child lock engaged	●	●	●	●	●	●	○	●

9. Because the automatic cleaning operation function keeps the inside of the system clean when the system is stopped, do not unplug the power cord after the test run, and verify that there is sufficient water in the water tank.

\* After installation, if the system will not be used for a long period of time, drain the water from the water tank and electrolyzed water tray, and fully dry the Virus Washer element.  
(For details, refer to the Instruction Manual.)

CONTENTS

8. MISCELLANEOUS

1. Maintenance of Virus Washer by Customer ..... 8-2

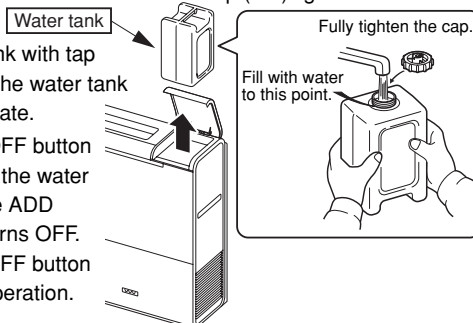
2. Pack Test ..... 8-3

# 1. Maintenance of Virus Washer by Customer

Applicable model: VW-VF10BG

## 1. When the ADD WATER lamp lights (Every day: Approx. 10 hours of operation at Med. fan speed)

- When there is no water in the water tank, the system stops automatically, and the ADD WATER lamp (red) lights in the display.
- Fill the water tank with tap water, then set the water tank in the original state.
- When the ON/OFF button is pressed after the water tank is filled, the ADD WATER lamp turns OFF. Press the ON/OFF button again to start operation.



NOTE: (1) Even if some amount of water remains in the tank, be sure to replace the water with fresh tap water every day.  
(2) Be sure to use normal tap water. Never use alkali ion water or any other type of water.

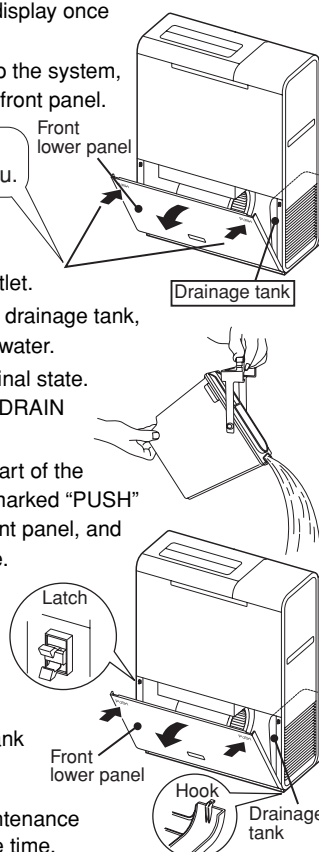
## 2. When the DRAIN lamp lights (Once or twice each week)

The DRAIN lamp (red) lights in the display once or twice each week.

- Press the ON/OFF button to stop the system, and open the bottom part of the front panel.

Press here at the same time, then pull the panel toward you.

- Remove the drainage tank, and drain the water into a bathroom sink or other similar drainage outlet.
- After draining the water from the drainage tank, rinse out the tank with fresh tap water.
- Set the drainage tank in the original state. After the tank has been set, the DRAIN lamp automatically turns OFF.
- Engage the tabs at the bottom part of the front panel, press at the points marked "PUSH" at the top left and right of the front panel, and set the panel in the original state.
- Press the ON/OFF button to start operation.



NOTE:

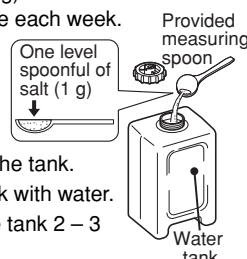
When the DRAIN lamp and ADD WATER lamp light at the same time, bring the water tank and drainage tank together to a bathroom sink or other similar drainage outlet, and perform the draining and water addition maintenance at the same time. Doing so can save time.

### Adding salt For condition "7"

Salt must be added in regions where the electrolysis condition is 7. The salt that is added must be composed 99% or more of NaCl. When the DRAIN lamp lights, add salt (1 g) to the water tank. In general, this is necessary once or twice each week.

#### ● Adding salt

- Ready the empty water tank.
- Remove the water tank cap, and use the provided measuring spoon to add one level spoonful of salt into the tank.
- After adding the salt, fill the water tank with water.
- Tighten the cap, and gently shake the tank 2 – 3 times to dissolve the salt.
- Gently set the water tank in place inside the unit.

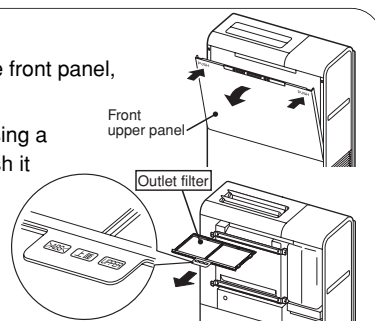


## 3. When the FILTER lamp lights (Every 1 or 2 months)

The FILTER lamp (red) lights in the display every 1 or 2 months. Follow the procedures below to clean the 3 filters.

### (1) Outlet filter

- Open the top part of the front panel, remove the outlet filter.
- Clean the outlet filter using a vacuum cleaner, or wash it with water and dry.
- Install the outlet filter, with the "UPPER" side on the tab of the outlet filter facing up.

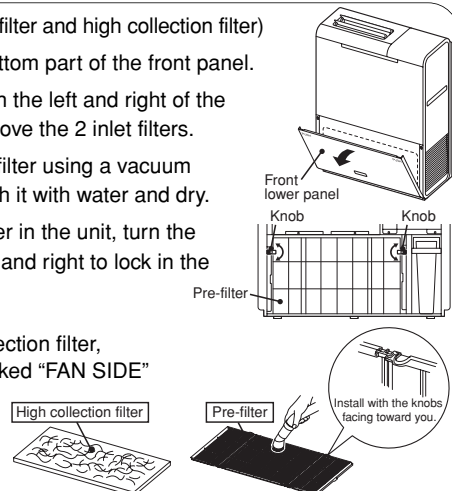


### (2) Inlet filter (pre-filter and high collection filter)

- Remove the bottom part of the front panel.
- Turn the tabs on the left and right of the pre-filter to remove the 2 inlet filters.
- Clean the inlet filter using a vacuum cleaner, or wash it with water and dry.
- Set the inlet filter in the unit, turn the tabs on the left and right to lock in the inlet filter.

NOTE:

Install the high collection filter, facing the side marked "FAN SIDE" toward the system (fan) side.



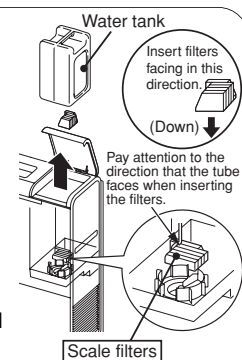
### (3) Scale filters

Prepare a towel or cloth before removing the wet scale filters.

- Remove the water tank, then remove the scale filters on the bottom face.  
\* The scale filters are connected by resin.
- Wash the scale filters with water to wash off any scale.
- Return the scale filters to their original location, while taking care about the installation direction.

NOTE:

If dirt becomes noticeable, replace the scale filters with new ones. The general guide for replacement is 1 year.



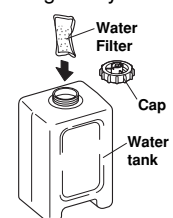
When the maintenance above is completed, press and hold the FILTER RESET button for 3 seconds to turn off the FILTER lamp.

### Water Filter In regions with high water hardness

Use the optional Water Filter (model: VW-WF100BG) to reduce the hardness of the water in the water tank when operating the system.

#### ● Replacing Water Filter pack(s)

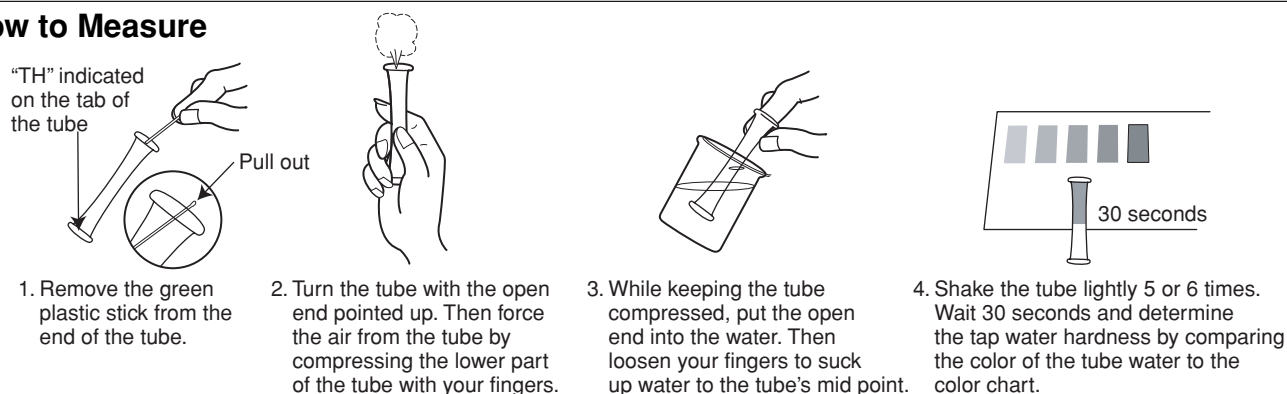
- When the FILTER lamp lights, it is time to replace the old Water Filter pack(s).
- Empty any remaining water, and remove the previously used pack(s) from the water tank.
- Put the specified number of fresh Water Filter pack(s) into the water tank.
- Refill the water tank with normal tap water.
- Replace the cap and return the water tank to its original position.



## 2. Pack Test

### Measuring Method for Pack Test of Tap Water Hardness

#### How to Measure

- 
1. Remove the green plastic stick from the end of the tube.
  2. Turn the tube with the open end pointed up. Then force the air from the tube by compressing the lower part of the tube with your fingers.
  3. While keeping the tube compressed, put the open end into the water. Then loosen your fingers to suck up water to the tube's mid point.
  4. Shake the tube lightly 5 or 6 times. Wait 30 seconds and determine the tap water hardness by comparing the color of the tube water to the color chart.

#### How to Verify the Color and Read the Measurement

Compare the color of the water inside the tube with the standard color chart after waiting the specified time. The value of the nearest color is considered the measured value of the tap water.

In case of an intermediate color between two color standards, estimate the intermediate value of the color shade.

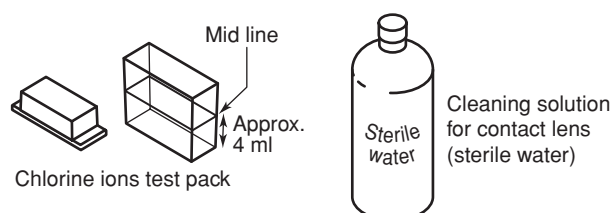
#### Measuring Method

1. Remove the green plastic stick from the end of the tube.
2. Turn the tube with the open end pointed up. Then force the air from the tube by compressing the tube's bottom part with your fingers.
3. While compressing the tube, stick the open end into the water. Then loosen your fingers and allow the water to be sucked about half way into the tube.
4. Shake the tube lightly 5 or 6 times. Then determine the water hardness level by comparing it to the standard color chart.
5. If the value of the tap water color exceeds a hardness level of max. 200 ppm referring to the standard color chart, measure again using the following method.

#### Measurement Method for Tap Water with Total Hardness Level Exceeding 200 ppm

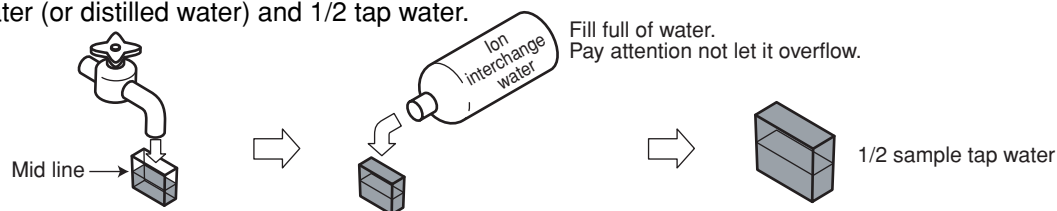
##### Necessary items

- Ion interchange water or distilled water (such as cleaning solution (sterile water) for contact lens)
- Supplied package (approx. 4 ml) for pack test of chlorine ions
- Pack test for total hardness (WAK-TH)

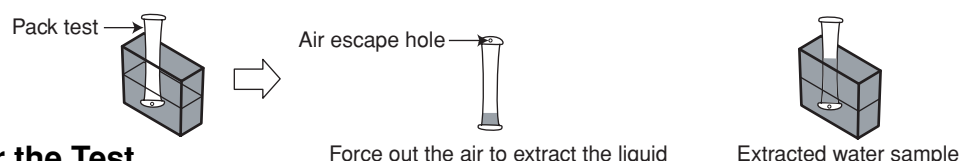


##### Measuring Method

1. Pour in approx. 4 ml of tap water until the mid line is reached in the test pack.
2. Add the ion interchange water (or distilled water) to the test pack (approx. 4 ml) adding to the tap water until the test pack is full. Pay attention to not let the liquid overflow. The test sample will then be a mix of 1/2 ion exchange water (or distilled water) and 1/2 tap water.



3. Follow the same procedure for the measurement of hardness as described above.
4. Compare the resulting color with the standard color chart. Doubling the value of the standard value as shown on the standard color chart gives you the value of the tap water hardness level.

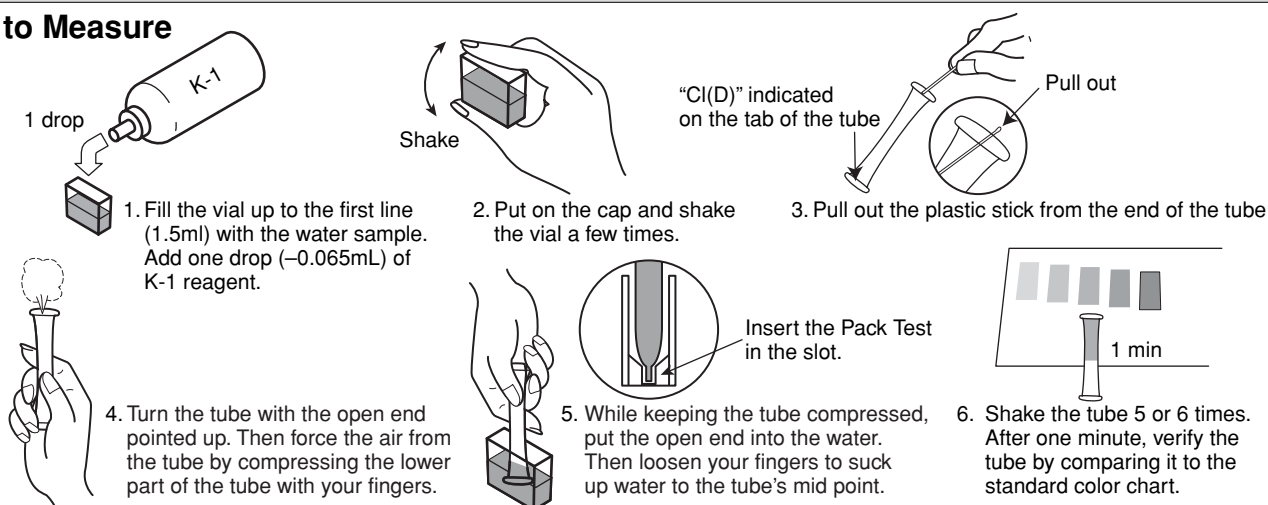


#### Caution After the Test

- Dispose of the remaining 1/2 quantity of sample water.
- Do not dispose of the used tube in the field after the pack test. Bring it back for separation and disposal as a burnable item following standard garbage treatment separation procedures.

## Measuring Method for Chloride Pack Test

### How to Measure



### How to Read the Test

After the reaction time, compare the color of the tube with the standard color chart.

The nearest color indicates the measured value of the sample. A color between two standard colors indicates a value between the two standard values. Estimate accordingly to determine the chloride concentration.

### Handle with Care

1. Keep the Pack Test in a cool, dry and dark place.
2. The Pack Test tube can be disposed of with domestic garbage.
3. Use the package as soon as possible.

### Do Not Spill the Tube Contents

Eyes : Immediately flush eyes with water for at least 15 minutes. Consult a physician.

Ingestion : Drink a large glass of milk or water and induce vomiting.

Skin : Flush skin with water.

In case of doubt, consult a physician.

### Nature of Test

The principle of this method is silver nitrate color comparison, allowing easy measurement of the chloride concentration in various types of sample water, for example, industrial waste water and environmental water.

### Cautions

1. The Chloride (Low Range) Pack Test allows the measurement of chloride ions ( $\text{Cl}^-$ ) in low concentrations.
2. If the chloride concentration is higher than 50 mg/L, a precipitate will occur. Always shake the tube lightly before comparing the reaction color.
3. If the chloride concentration is higher than 150 mg/L, the precipitate will be white. If the chloride concentration is approximately higher than 500-1000 mg/L, the precipitate will be more significant and may lighten the reaction color. Especially pay attention if the concentration is higher than 1000 mg/L. If you expect a high concentration of chloride, dilute the sample water before the measurement using distilled water. Usually, the chloride concentration of river water or tap water is 20 – 50 mg/L.
4. To measure chloride used for water disinfection (residual chlorine from sodium hypochlorite, for instance), it is recommended that you use the following products:  
Residual Chlorine (Free) Pack Test, ref: WAK-CIO.DP  
Residual Chlorine (High Range) Pack Test, ref: WAK-CIO (C)
5. The normal pH range is 6 – 10. If necessary, adjust the pH level using diluted sulfuric acid or sodium hydroxide solution.
6. Ensure that that Pack Test tube is filled to the half-way point.
7. Partially un-dissolved reagent will not affect the measurement.
8. Keep the sample temperature in the range 15 – 30°C. Lower temperatures necessitate a longer reaction time.
9. Read the test under a "daylight type" lamp.
10. Be careful to prevent reagent spillage.

### Standard colors

The standard colors on the chart were determined using colors from standardized solutions. Bromide ions, iodide ions, cyanide ions and phosphate ions react with the reagent, inducing color changes.

Sulfite ions, thio-sulfate ions, and sulfide ions can interfere with the color results. These sulphur compounds can be oxidized with hydrogen peroxide. Because of the high chloride concentration, the Chloride (Low Range) Pack Test is not suitable for seawater samples.

**SANYO**